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Number 4

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TEXTILE WORLD RECORD

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LORD & NAGLE COMPANY · Boston & Philadelphia

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The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the warp or chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING

DYEING

DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Patent Combination Rolls made of Cotton and Husk especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, drawings and full particulars of complete plants furnished on application

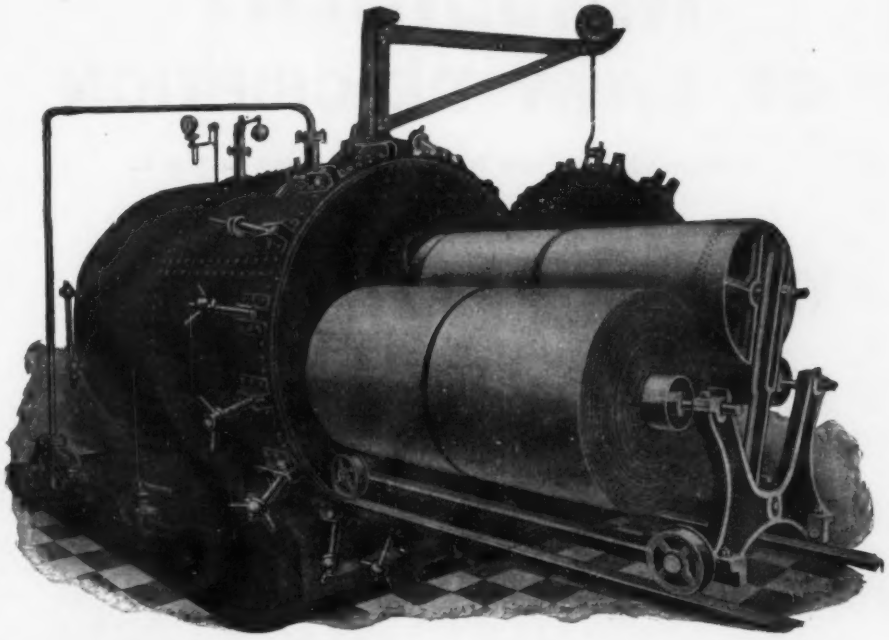
Southern Agent, STUART W. CRAMER, Trust Bldg., Charlotte, N. C., Equitable Bldg., Atlanta, Ga.

Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
U. S. Patent, January 15th, 1901. No. 666,056



H. W. Butterworth & Sons Co.

Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

YORK AND CEDAR STREETS

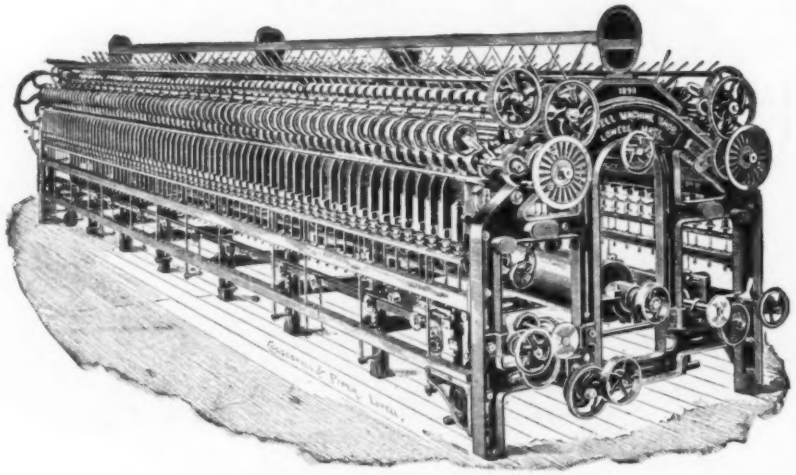
PHILADELPHIA

Sole Makers for the United States

AMERICAN WORSTED MACHINERY

OF EVERY DESCRIPTION

with modifications to suit any class of work.



WORSTED CAP SPINNING FRAME.

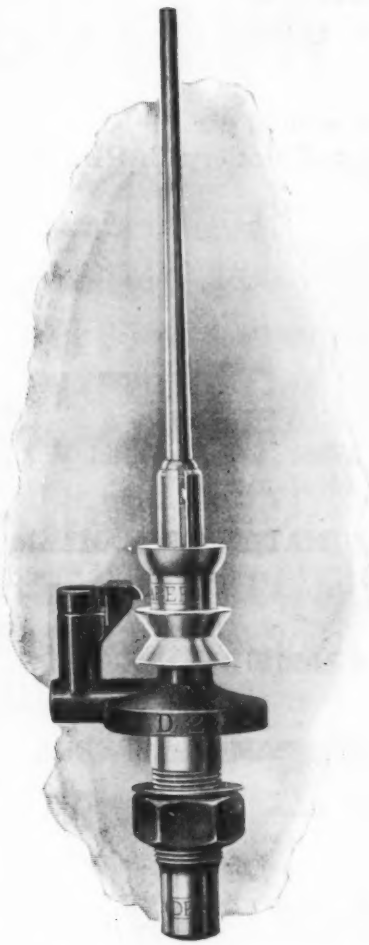
Flyer and Ring Spinning Frames, Dandy Rovers and Reducers, Cone Second Finishers, Reducers and Rovers, Cill Boxes for Drawing, Preparing and Finishing, Weigh Boxes and Drawing Boxes, Cap Trap, Flyer and Ring Twisters.

Specifications and Estimates Furnished Upon Application.

LOWELL MACHINE SHOP

LOWELL, MASS.

A New Spindle Improvement



The Rabbeth Centrifugal Bobbin Clutch.

Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

Allows easier and quicker doffing—stronger bobbins—less reaming.

Draper Company, Hopedale, Mass.

We Also Build Looms.

HARWOOD'S MACHINERY

Increases Production,
Improves Quality,
Decreases Labor Cost.

THE BRAMWELL FEEDER (over 12,000 now in use.)
For Woolen, Worsted, Shoddy and Hosiery CARDS and GARNETT Machines.

THE APPERLY FEEDER (over 15,000 in use.)
For Second Breaker and Finisher CARDS.

THE BRAMWELL PICKER FEEDERS (two styles.)
For Burr and Mixing Pickers, also Fearnaughts.

THE NEW 1902 BRAMWELL OPENER AND FEEDER,
A Complete Machine. For Wool Washers and Wool Dryers.

SOLE AGENTS FOR THE SPENCER AUTOMATIC STOCK OILER,
Send for Sheet of Testimonials. Saves Oil, Labor and Waste.

A NEW CLUTCH ATTACHMENT FOR BRAMWELL FEEDERS,
Positive and Durable.

A FULL LINE OF PINS AND PARTS FOR LAMAIRE FEEDS.

IMPROVED APRONS AND REPAIRS OF ALL KINDS.

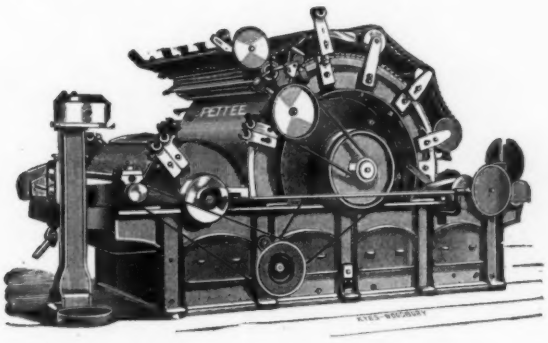
GEO. S. HARWOOD & SON,
53 State Street, Room 703,
BOSTON, MASS.

Long Distance Telephone, 3212 (Main) Boston.

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

COTTON MACHINERY



PICKERS,
REVOLVING FLAT CARDS,
DRAWING FRAMES,
RAILWAY HEADS,

SLUBBING,
INTERMEDIATE AND ROVING FRAMES,
SPINNING FRAMES,

SPOOLERS AND REELS.

Shops: { **Biddeford, Me.**
Newton Upper Falls, Mass.

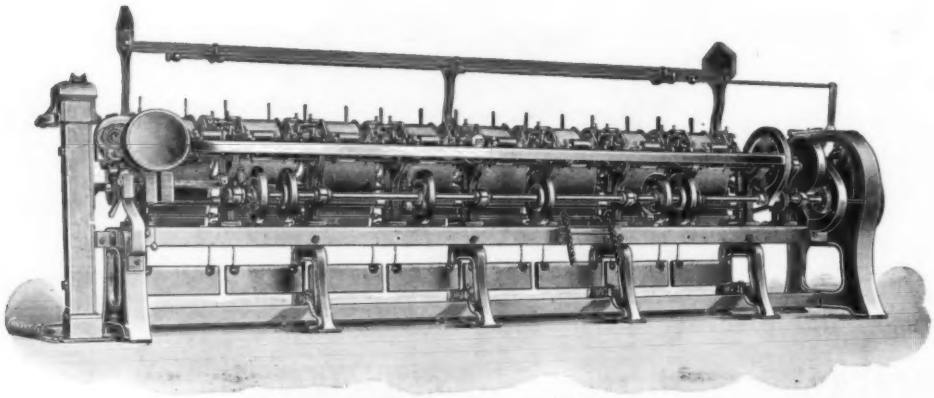
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



The Whitin 8 Head Comber.

Southern Agent, . . . S. W. CRAMER

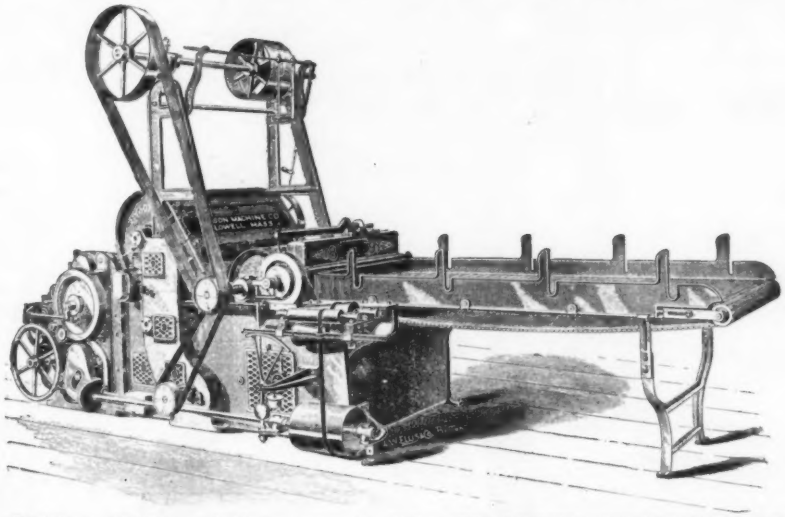
Trust Building, CHARLOTTE, N. C.
and Equitable Bldg, ATLANTA, CA.

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines,
Combers,
Railway Heads,
Drawing Frames,

Spinning Frames,
Spoolers,
Twisters,
Reels,
Looms,
Long Chain Quilling Machines.

The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

KITSON MACHINE CO., LOWELL, MASS.

LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

STUART W. CRAMER, Southern Agt., Charlotte, N. C. and Equitable Bldg., Atlanta, Ga.

SCOTT & WILLIAMS

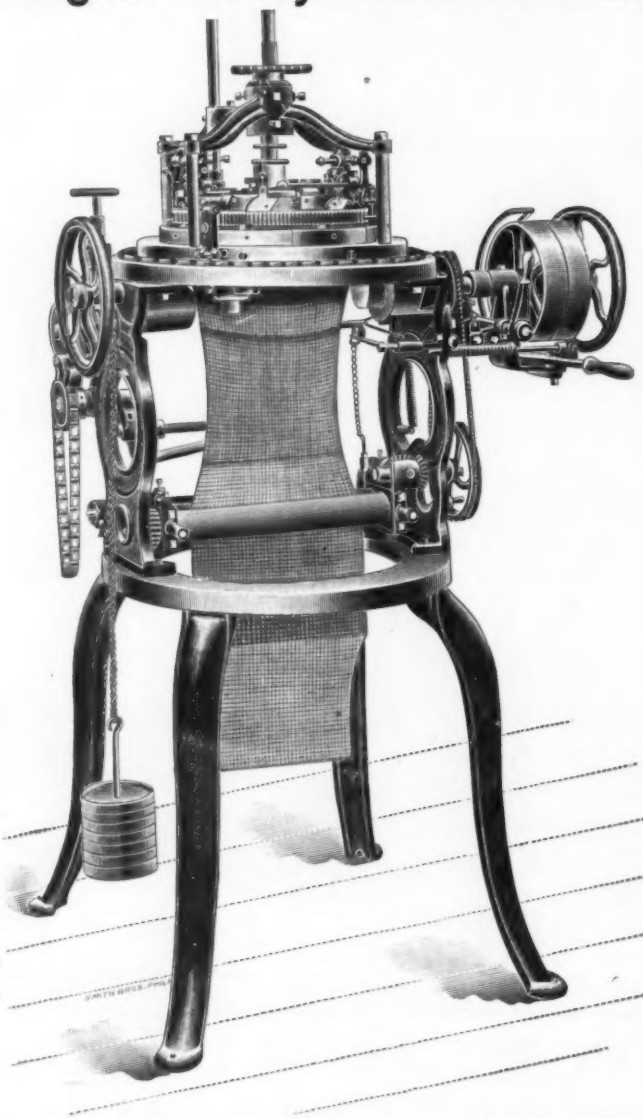
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes, 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

2079 E. Cumberland Street, Philadelphia, Pa., U. S. A.

BRANSON MACHINE CO.

BUILDERS OF

KNITTING MACHINERY

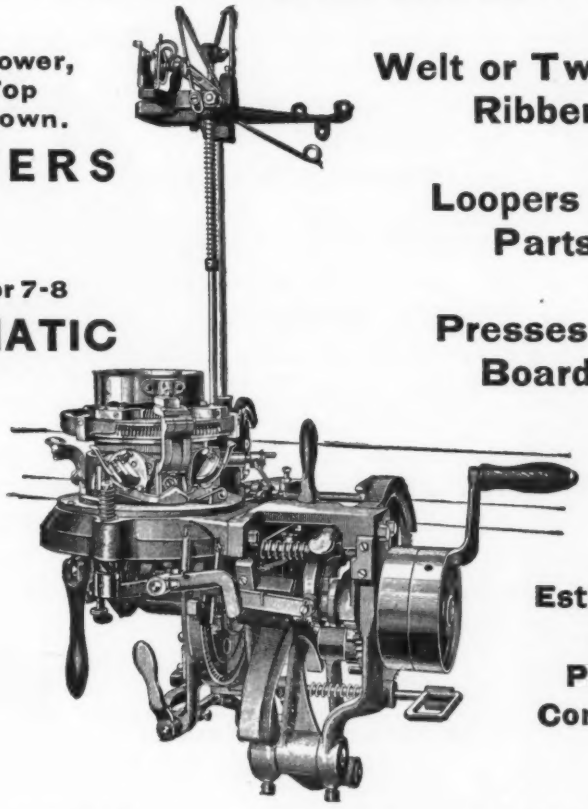
Hand or Power, Open Top or Hold Down.

KNITTERS

1-2, 3-4 or 7-8

AUTOMATIC KNIT-TERS

All Sizes and All Gauges.



Welt or Two-Feed Ribbers.

Loopers and Parts.

Presses and Boards.

Estimates for Plants Complete.

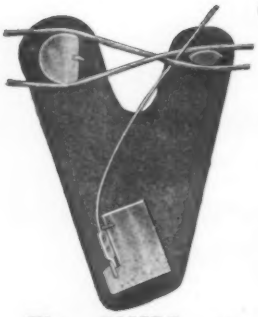
Winders and Bobbins. Hand Forged Steel Cylinders.

BRANSON MACHINE CO.

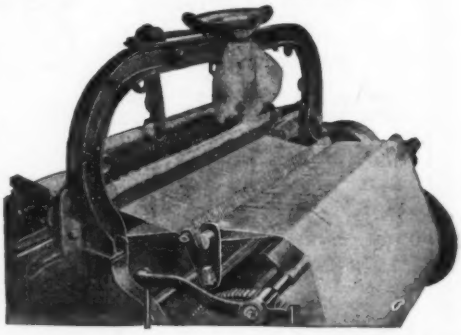
504 North American Street, : : Philadelphia, Pa.

Write for information and Catalogue.

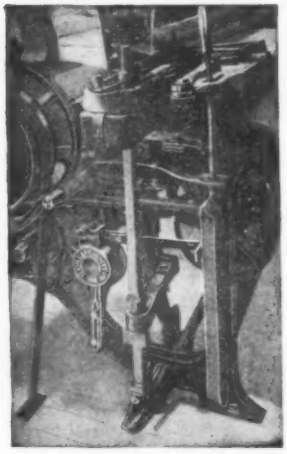
Bed-Rock Simplicity with Absolute Efficiency



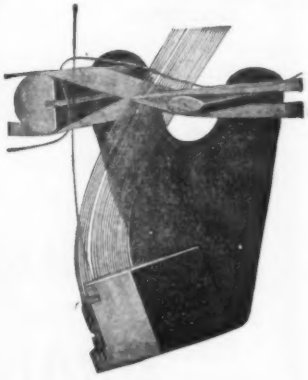
Our **WARP-STOP** controls **TWO threads by ONE spring WIRE, held in a COMB,** engaging the warp in such a way that **the TENSION is UNDER CONTROL** and **ABRASION of the yarn is AVOIDED.**



The COMBS are RAPIDLY INSERTED BEFORE or AFTER the warp is in the loom, and are carried in a bar suspended from **the LEASE-RODS** which **are NOT FIXED** to the loom side, but **FREE to take their proper positions,** and **ALLOW the NATURAL MOVEMENT** of the **WARP,** so that **the COVER of the cloth is UNAFFECTED.**



When a thread breaks the WIRE SPRINGS OUT from the comb, thus giving **a CLEAR SIGNAL of the place of the BROKEN END,** and, by striking **a CONTACT SLIP upon which LINT CANNOT COLLECT,** closes the circuit through **a PERFECT KNOCK-OFF, EASILY and RAPIDLY FIXED,** and **actuated by a SPARKLESS current.**



TEXTILE APPLIANCES, LIMITED,

Providence, R. I.

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENT IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber will comb from 7-8″ stock to Sea Islands.
Platt's Special Machinery for Making Cotton Waste into Yarns.
Platt's Special Machinery for Making French Worsted Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.
Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery. Archbutt-Deeley System for purifying and softening water.

TEXTILE MACHINERY ASSOCIATION, LTD.

Flax, Hemp and Jute Machinery.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material

GEORGE HODGSON, LTD.

Looms for Worsteds, etc.

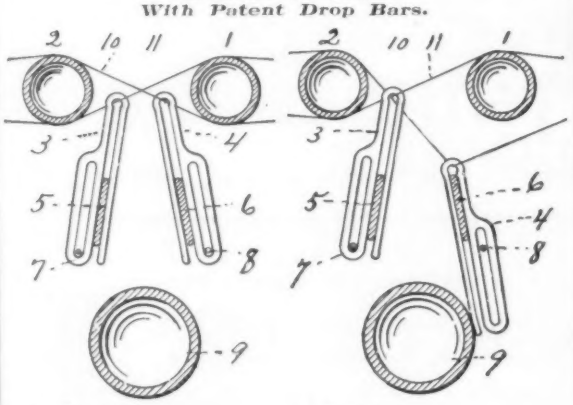
JOSEPH SYKES BROS., Card Clothing for Cotton.

JAMES CRITCHLEY & SON'S, Card Clothing for Woolen and Worsted.

DRONSFIELD BROS'. Grinding Machinery and Emery Filleting.
The Best French and English Combing and Rubbing Aprons.
Harding's Pins and Circles, Varey's Fallers, etc.

THE "C. & G." IMPROVED STOP-MOTION AND METHOD OF APPLYING TO WARP.

With Patent Drop Bars.



1, 2, Lease-rods.
5, 6, Upper circuit guide-rods.
9, Lower circuit bar.

3, 4, Drop-bars
7, 8, Retaining rods.
10, 11, Warp threads.

The above cut shows the stop-motion with drop-bars in normal position before break in warp thread, the electric circuit from the upper circuit guide-rods to the lower circuit bar "9" not being completed.

The above cut shows stop-motion after a break in warp thread "10," the drop-bar "4" having fallen and completed the electric circuit from the upper circuit guide-rod "6" to the lower circuit bar "9," thereby stopping the loom.

THE COLDWELL-GILDARD

Warp-Stop Motion

FOR LOOMS

(Broadly covered by Patents Issued and Pending)

Many thousands placed in successful operation during the past four years on coarse, medium, and fine cottons, velvets, plushes, ginghams and alpacas in leading mills.

EFFICIENCY — SIMPLICITY — DURABILITY — ECONOMY

Widest in Range of Use. Lowest in Cost of Maintenance.

Decreased Weaving Cost; Improved Quality of Product; A "Universal" Stop-Motion.

Samples and copy of our Illustrated Catalog sent on application

THE COLDWELL-GILDARD CO., 108-110 Hartwell St., - FALL RIVER, MASS.

HENDERSON'S

Double Garding Process for Wool

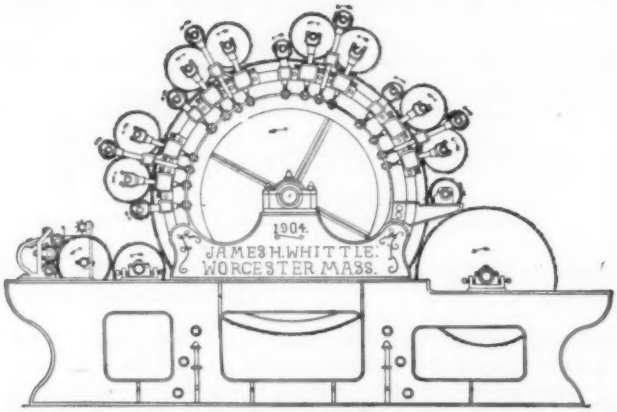
(Patented May 10, 1904)

Is a Great Success.

Manufactured By **JAMES H. WHITTLE,** 150 Harlow St., Worcester, Mass.

INCREASES PRODUCTION AND QUALITY

SAVES LABOR



SAVES ROOM

APPLIED TO EITHER OLD CARDS OR NEW

WOOL AND WORSTED MACHINERY

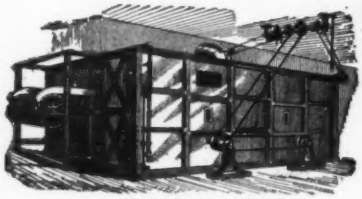
Including Carding Machinery for Wool and Worsted, Yarn Twisters, with or without Novelty Attachments, Yarn Dressers, Reels, Beamers, Single or Double. Yarn Spoolers, Dresser Creels, Cloth Dryers, of all widths, New Rotating Skein Dryers, Four and Eight Drum Spoolers, Improved Hydro Extractors, Improved Dusters with Fan, New Pattern Mixing Picker, Skein Drying Reels, etc.

"HURRICANE" DRYERS AND FANS

For WOOL,
COTTON STOCK,
YARN, STOCKINGS,
UNDERWEAR,
Etc.

Write for Booklets.

Truck Yarn Dryer.



Cotton Stock and Wool Dryer.

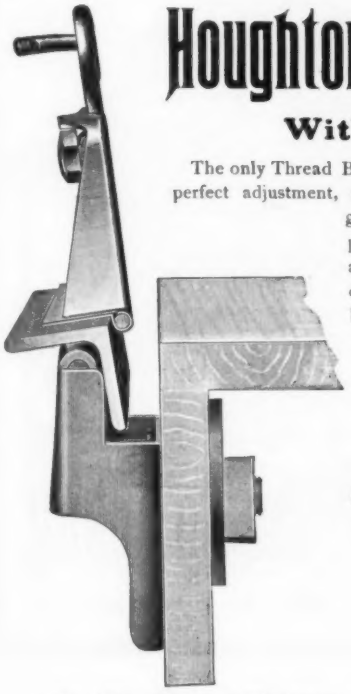
CARBONIZING,
BLEACHING,

"Hurricane" Fan, Style No. 2.

OXIDIZING, CHROMING and WASHING MACHINERY.

PHILADELPHIA DRYING MACHINERY CO.

6721 Germantown Ave., Philadelphia, Pa.



Houghton's All Steel Thread Board

With Hardened Thread Guides.

The only Thread Board that ***holds a guide solid*** all the time; ***never*** gets loose; is always in perfect adjustment, and thus must make a saving in travelers, broken ends, waste, thread guide, care and also prolong the wear of rings and increase the production per spindle. These claims are based on the truth of mechanical principles and have been proven true by actual use in many mills, whose superintendents will substantiate these claims. Write for list of mills using our Thread Boards.

PRICE.
Steel Thread Boards, 7½c. per Spindle
Brass Thread Boards, 15c. per Spindle
f. o. b. Worcester.
Add 3c. each for Metal Rail.

1,000,000 Already in Use.

Thousands of wooden thread boards thrown aside and replaced with my Steel Boards because they pay for themselves annually.

PATENTED.

Nov. 30, . .	1897	Nov. 9, . .	1901
Mar. 8, . .	1898	June 9, . .	1903
July 1, . .	1901	Mar. 1, . .	1904
		May 10, . .	1904

and other patents pending.
Any infringements of the above Patents will be prosecuted

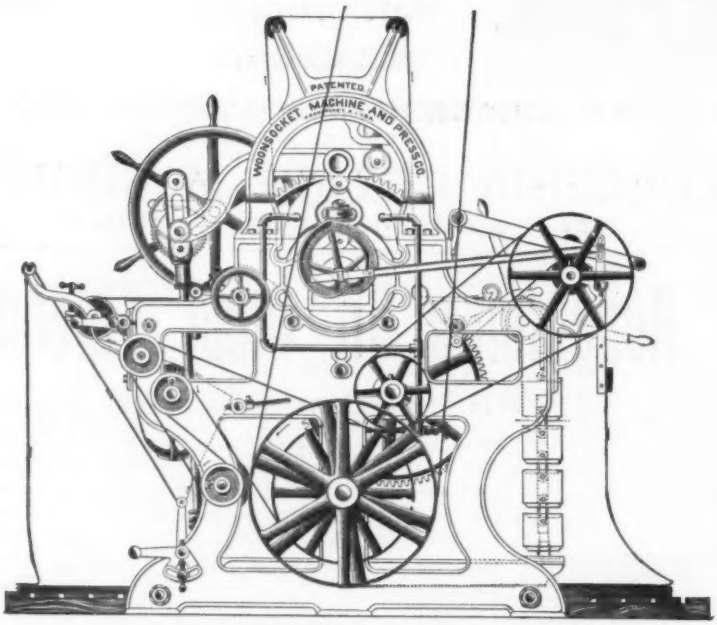
L. T. Houghton, Sole Manufacturer, Worcester, Mass.

Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



THE WOONSOCKET ROTARY PRESS.

Woonsocket Machine and Press Company

WOONSOCKET, R. I,

Satisfy Yourself and Gratify Us

Satisfy yourself that the

CROSS OIL FILTER

Will Save One-half the Cost of Oil

by having us send you the Filter on thirty days' trial. It will gratify us because we know it will please you—but you take no chances if the Filter is not satisfactory. Return it and we will pay all transportation charges.

"The Cross Oil Filter is giving good satisfaction."—Memphis (Tenn.) Light & Power Co.

Delays are Dangerous

If you put off getting

The Burt Exhaust Head

you are every day adding additional expense for repairs to roofs and walls of your plant, damaged by water and oil that issues from the Exhaust pipe, and which the Burt Exhaust Head prevents. It stops the disagreeable noise of the exhaust, too.

"The three Burt Exhaust Heads at our plant are giving good satisfaction."—Toledo (Ohio) Heating and Lighting Co.

Now is the time to order, don't wait until the damage is done. Send size of pipe; if you do not like the head after you get it, return it at our expense.

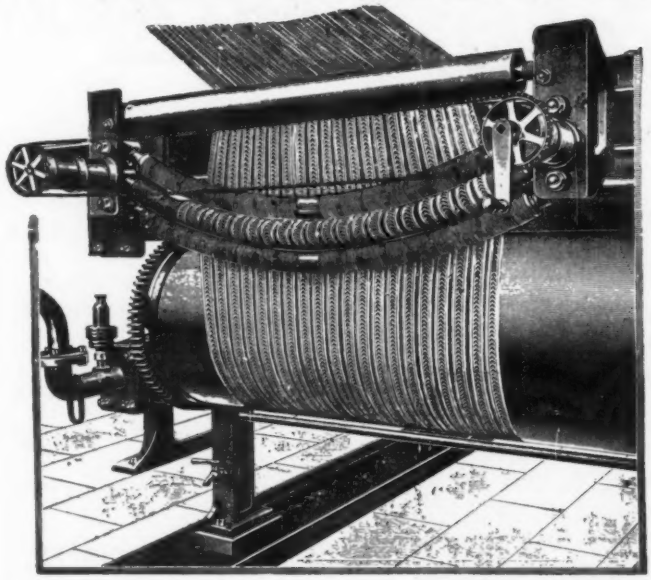
The BURT MFG. CO.,

LARGEST MANUFACTURERS OF OIL FILTERS IN THE WORLD.

214 Main St., AKRON, OHIO, U. S. A.

ALSO SUPPLIED BY OIL COMPANIES, DEALERS AND POWER CONTRACTORS.

ERFECT CLOTH EXPANDER



The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

THOMAS LEYLAND & CO., 53 INDIA ST., BOSTON.

Sole Agents for the United States and Canada.

NOT ONLY
THE LATEST
BUT ALSO THE
SIMPLEST and BEST.

THE CAMLESS WINDER.

For Cones and Tubes.

Send for Descriptive Circular.

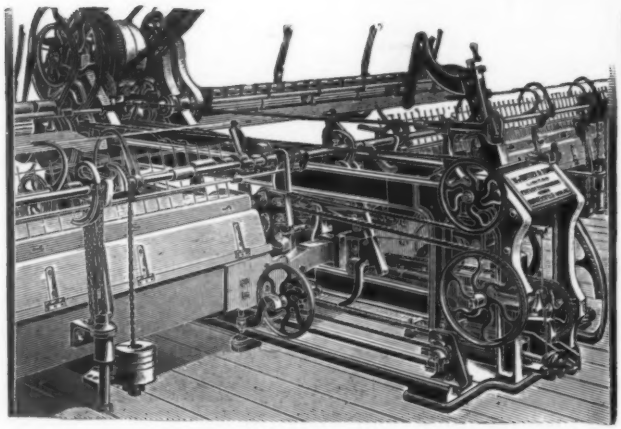
The A. T. ATHERTON MACHINE CO.

PAWTUCKET, R. I.

Telegraphic Address: "WHITELEY, HUDDERSFIELD." Nat. Telephone, 598 and 599.

Wm Whiteley & Sons Ltd

LOCKWOOD, HUDDERSFIELD.



SELF-ACTING MULE.

Makers of all descriptions of Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

Cross Raising Machines, Wool Scouring Machines,

Hydro Extractors. Warp Sizing.

Cool Air Drying and Beaming Machines.

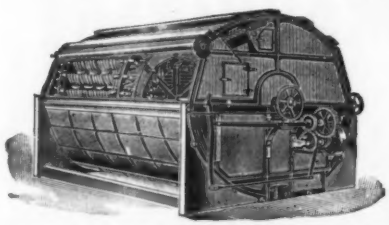
Warping Mills with Patent Sectional Dividing Apparatus.

Self-Acting Mules. Bobbin or Pirn Winder, &c., &c.

Mercerizing Machinery.

Second-hand Tentering Machines in good repair at low prices.

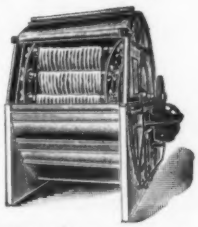
SKEIN AND SLUBBING MACHINES



SAVES

75% in Labor.
30% in Winding.
Steam and Dye Stuffs.
No Friction.
No Tangling.

CAPACITY
50 to 700 lbs per batch.



THE KLAUDER-WELDON DYEING MACHINE CO.

AMSTERDAM, N. Y.

Builders of Machines

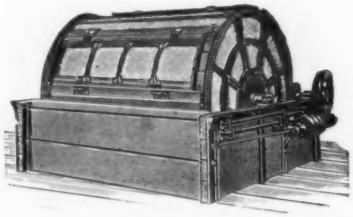
For Skein—Worsted, Slubbing, Cotton and Silk.
" " and Warp Mercerizing.
" Raw Stock Cotton, Wool, Waste and Rags.
" Garments Underwear, Hosiery and Caps
" Sulphur Colors—Raw Stock, Skein and Hosiery.

RAW WOOL AND COTTON MACHINES.

CAPACITY
200 to 1000 lbs per batch.

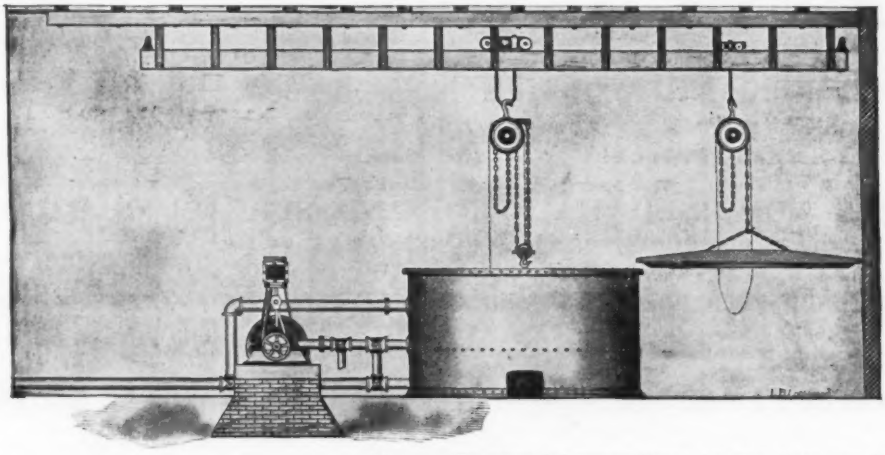
SAVES

50% in Labor besides Steam and Dye Stuffs. Practically indestructible. Leaves stock in perfect condition.



VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY DYEING MACHINES



OFFICE OF TREMONT & SUFFOLK MILLS, LOWELL, MASS., Jan. 14, 1904.

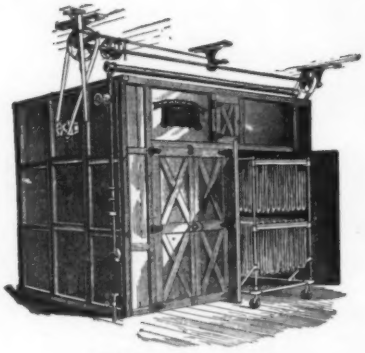
VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: Replying to your inquiry in regard to what we think of your Raw Stock Dyeing Machine, would state that we have been using one about six months, with very satisfactory results, the dyeing being level, and the stock left in first-class condition for spinning. Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

Yours truly J. J. CONNELL, Agent.

"20th CENTURY" MACHINERY

DRYERS
for
WOOL,
COTTON STOCK,
YARN, STOCKINGS,
UNDERWEAR.
VENTILATING FANS.
MACHINERY
for
CARBONIZING
and
YARN SCOURING.



TRUCK YARN DRYER.

CLOTH WASHERS
and
CLOTH DYEING MACHINES, BLEACHING MACHINERY FOR KNIT GOODS, ETC.
CONTINUOUS SYSTEM FOR BLEACHING COTTON STOCK.
TOM-TOMS,
CHROMING, WASHING
and
OXIDIZING MACHINES.

AMERICAN DRYING MACHINERY COMPANY,

19th AND WESTMORLAND STS., PHILADELPHIA, PA.

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LAWSON BRANCH,

Hope Foundry. **LEEDS.** **England.**

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PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

GOOD'S COMBINED HACKLING AND SPREADING MACHINE,

LONG REACH SCREW-GILL DRAWING FRAMES,

CHAIN-GILL DRAWING FRAMES with Apron Head,

PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,

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Special Machinery for the manufacture of Rope Yarns and Binder Twine.

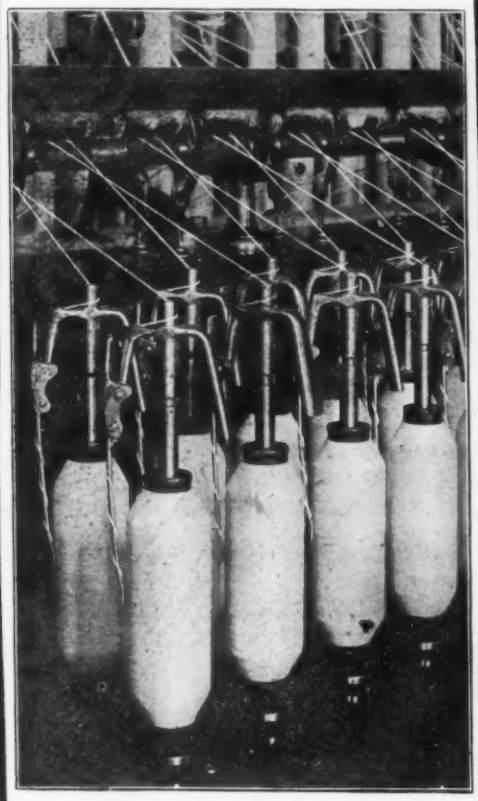
IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS

BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

THE DUNN FLYER

Presents new principles and methods in Flyer construction that have proved their value and made its use of marked advantage.



3½ Inch Diameter Bobbins

are built with 7x3 Dunn Flyers on 4½" space frame with the further advantage of being able to run as fine as 15 hank roving on same flyers. Further information may be promptly obtained by addressing the

TEXTILE MACHINERY COMPANY

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EASTON AND BURNHAM MACHINE CO.

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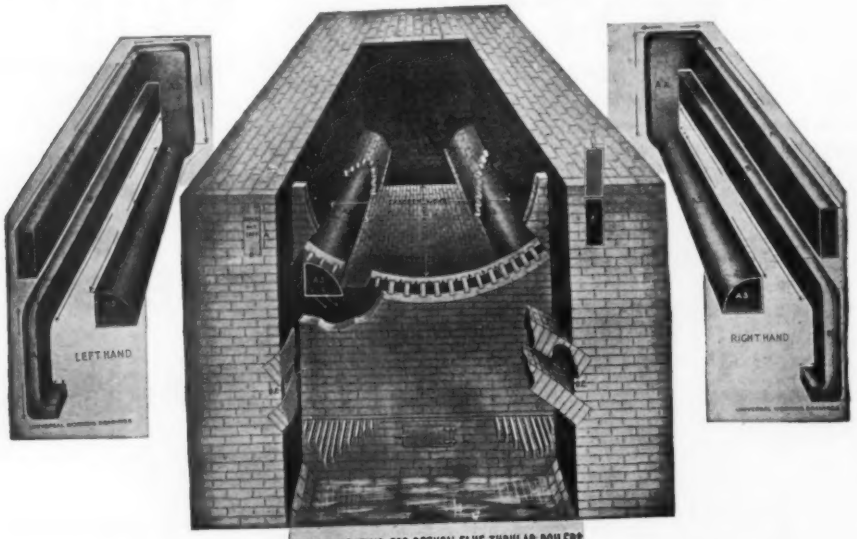
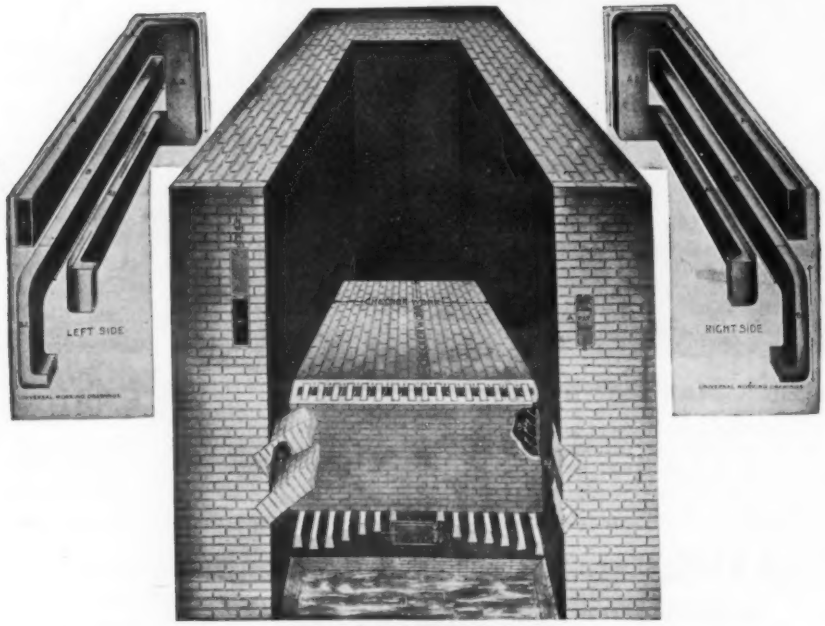
The Smoke Nuisance and the Profligate Waste of Fuel is Settled for all time

By the invention and practical operation of the DR. J. B. HARRIS SYSTEM. Absolute combustion of soft coal in steam boiler furnaces. NO SMOKE. Cheap and efficient. Harris' Smoke Consuming Furnaces last as long as the boiler. 35 per cent. to 50 per cent. cheaper. By actual test evaporates 33 1-3 to 40 per cent. more water per pound of combustible. Burns any kind of fuel without smoke. Burns crude oil without smoke or odor. Pays for itself in six months. Patented March 22, 1904.



TYPICAL SETTING FOR RETURN FLUE TUBULAR BOILERS



TYPICAL SETTING FOR WATER TUBE BOILERS

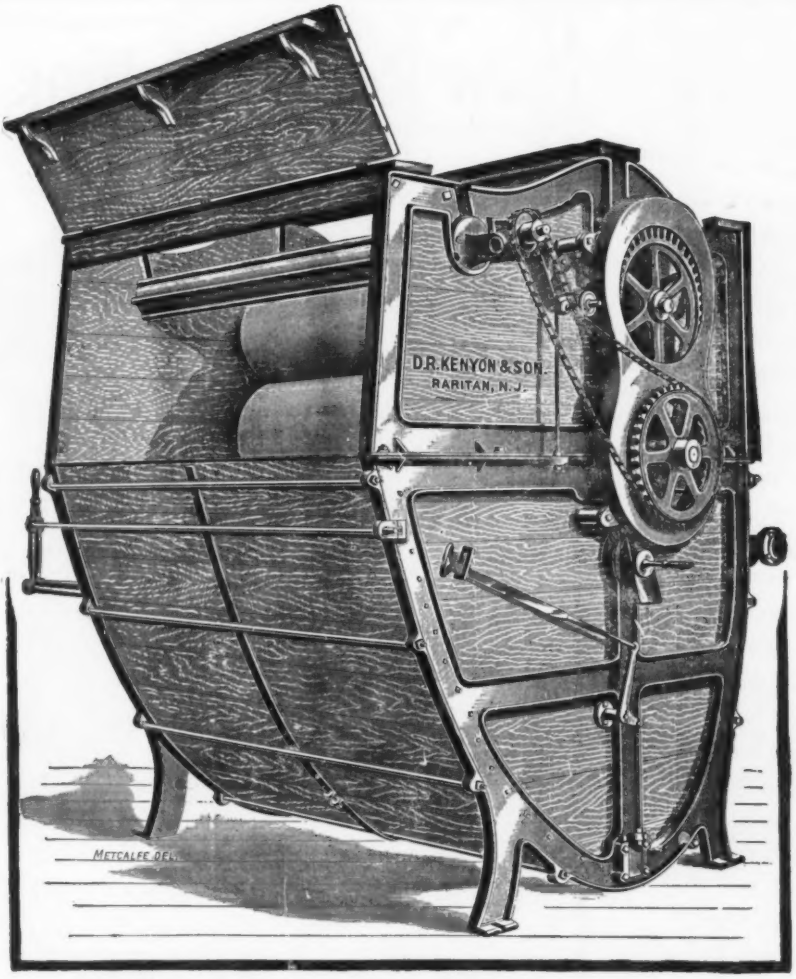
...ine, Franklin, Geary, and with modifications in floor of Combustion Chamber suited to Babcock & Wilcox, Zell, Root, Stirling, etc.

Write for catalogue. County and State rights for sale, with or without royalty.

J. B. HARRIS, M. D., Patentee and Sole Owner, **71 Arcade, Nashville, Tenn.**

Kenyon's Improved Cloth Washer

FOR FOUR, SIX OR EIGHT STRINGS OF GOODS



BEST QUALITY SOLID ROLLS.

Improved trough and valves, preventing wash of liquor and insuring quick and thorough scouring and rinsing.

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RODNEY HUNT MACHINE COMPANY

WATER WHEELS,
Horizontal and Vertical.
Iron Flumes and Penstocks.
Rotary Fire Pumps.
Centrifugal Pumps.
Head Gate Apparatus.
Water Wheel Regulators.
Rotary Fulling Mills.
Rotary Cloth Washers.
Rotary Knit Goods Washers.
Combined R'y Fulling Mill
and Washer for Knit Goods.
Endless Felt R'y Washers
and Rotary Felling Mills.
Hammer Falling Stocks.
Dolly Washers.
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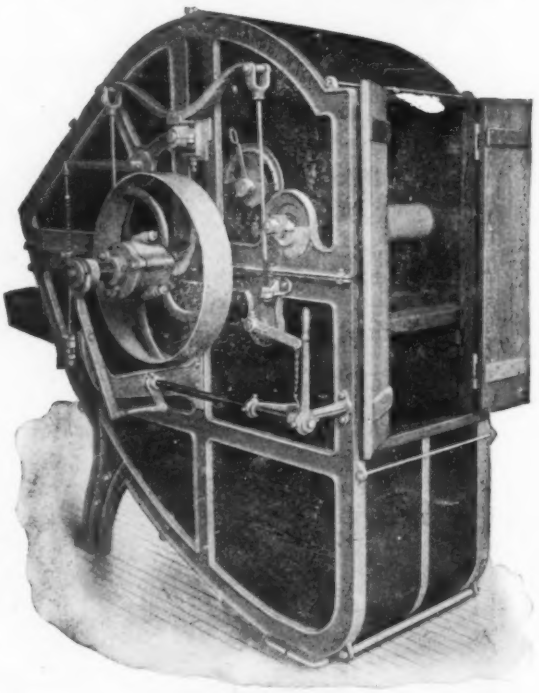
Crank Knit Goods Washers.
Wringing and Rinsing Mchs.
Reel Dyeing Machines.
Carbonizing Machines.
Bleaching Machines for
Chloride of Lime and
Peroxide of Sodium,
Dye Tubs and Rinsers.
Wool Washers.
Soaping Machines.
Cloth Winders.

New Rotary Fulling Mill



Type T. Common Capacity for all Fabrics. Circular No. 13.

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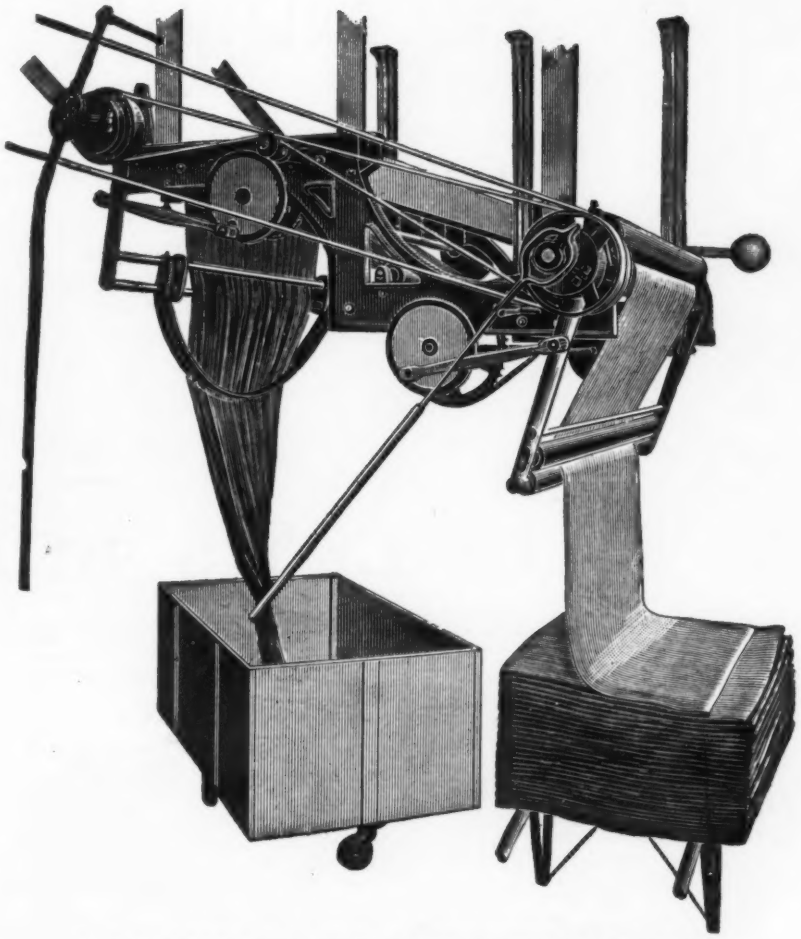
The Hunter CLOTH OPENER AND FOLDER



ONE MAN CAN OPEN AND FOLD MORE GOODS IN A DAY WITH THIS MACHINE THAN FOUR MEN CAN DO BY HAND.

No stretching or beating of goods under tension. All the parts coming in contact with cloth are brass or wood.

Opens any width of cloth from 63 inches down to 30 inches. Can be built wider for blankets.

James Hunter Machine Co., North Adams, Mass.

YOU WANT THE BEST. WE BUILD THEM.

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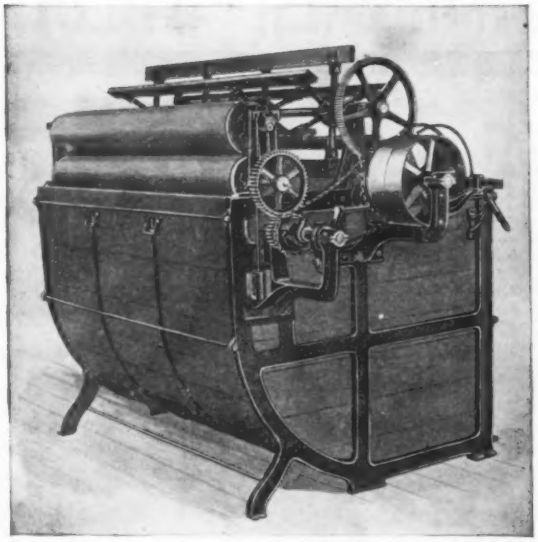

1903 PIECE DYEING MACHINE.

FULLING MILLS

Piece Dyeing Machines,
Dye Tubs, Vats,
Tanks, etc.

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PROVIDENCE AND BRIDGETON, R.I.

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Our machines are up to date.
Patented features found in no others.
Most effective and economical machines built.

Send for Catalog, Prices, and also ask about our fulling mill for extra heavy goods and blankets.

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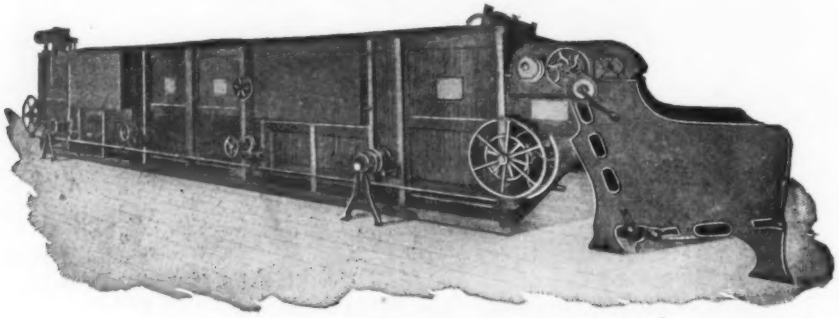

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Stock Dryers, Wool Washers,
Wool Dusters, Carbonizing Plants,
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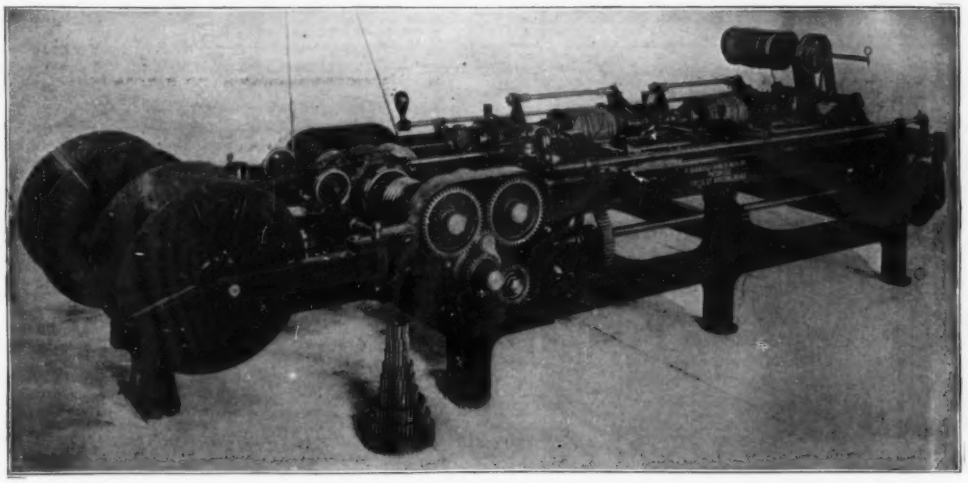
THE HASKELL-DAWES MACHINE CO.

Manufacturers of the best types of

Forming, Twisting and Laying Machinery

Which are adapted for making all kinds of

COTTON CABLE-LAID TWINE, CORD and ROPE



The Haskell-Dawes Machines are built upon a NEW PRINCIPLE, whereby the MOST POSITIVE RESULTS ARE SECURED. They occupy LESS SPACE than the ordinary type of machines, require LESS RELATIVE POWER, and will turn out a MUCH LARGER PRODUCT of Twine and Rope. The SPECIAL ATTENTION of Cotton Manufacturers is called to our new FORMING AND ROPE-LAYING MACHINES. Descriptive Catalogue Sent on Application.

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ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS.

SOLID SASH AND CURTAIN CORDS,

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AND ALL BRAIDED FABRICS.

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for WOOLENS, WORSTEDS, FELTS, etc.

Built Upright or Horizontal with Low Down Feed

Ventilating Fans a Specialty

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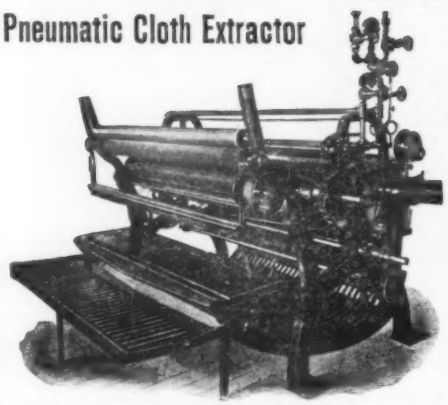
Pneumatic Cloth Extractor



Stiner's Pneumatic Extractor will extract goods in the open-width. This machine will extract from 25 to 40 yards per minute and once through the machine does the work. I have one of my extractors now running over 30 yards per minute in one of the most progressive mills where only the best machinery can be used to manufacture their fine goods.

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If you are interested in the line of machinery which I build, please write for cut and further particulars. Address all correspondence to

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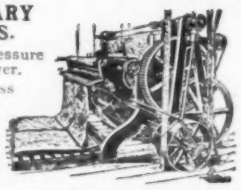
New and Second-Hand Cloth Presses

LATEST MILLER ROTARY STEAM CLOTH PRESS.

Patent Flexible Steel Bed. Pressure automatically appplied by power.

16/4 double bed second-hand press
18/4 " " " "
16/4 single " " "
at a bargain.



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E. FEARON & CO.

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Both 'Phones.

EUREKA FIRE HOSE

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For use in

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Seamless Woven and Rubber lined EUREKA COTTON HOSE, "TROJAN" brand, has no equal. Send for circular and Testimonials.

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It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

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Let us send you the most accurate and rapid cloth measurer ever devised On trial

NO LITIGATION
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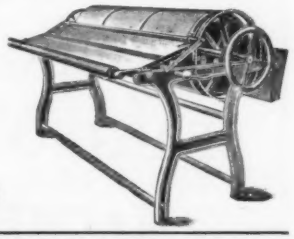

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Roving Spindles and Flyers a Specialty. Light Forgings.

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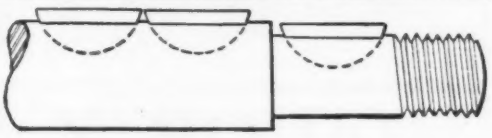
Key Seating Attachment

FOR

Whiton Gear Cutter



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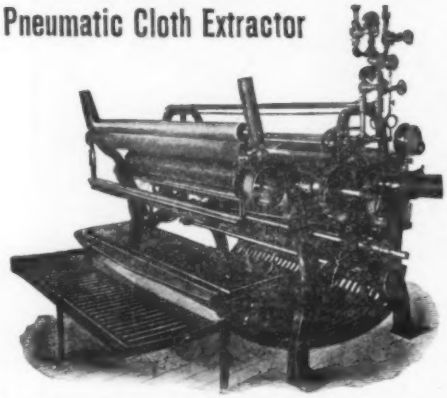

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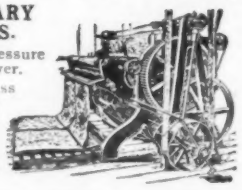
1 6/4 single " " "
at a bargain.



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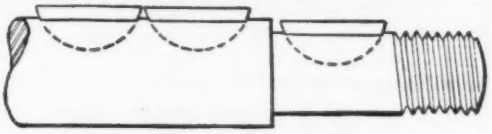

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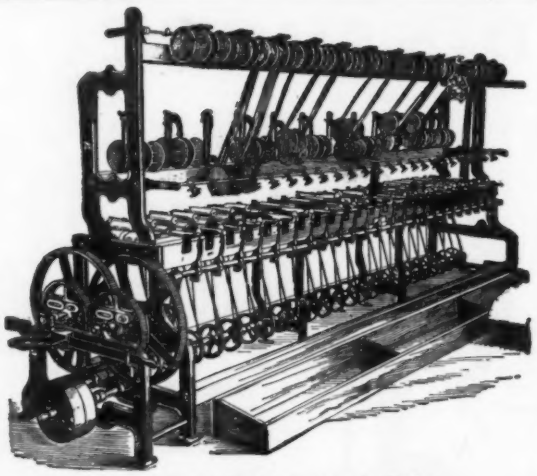
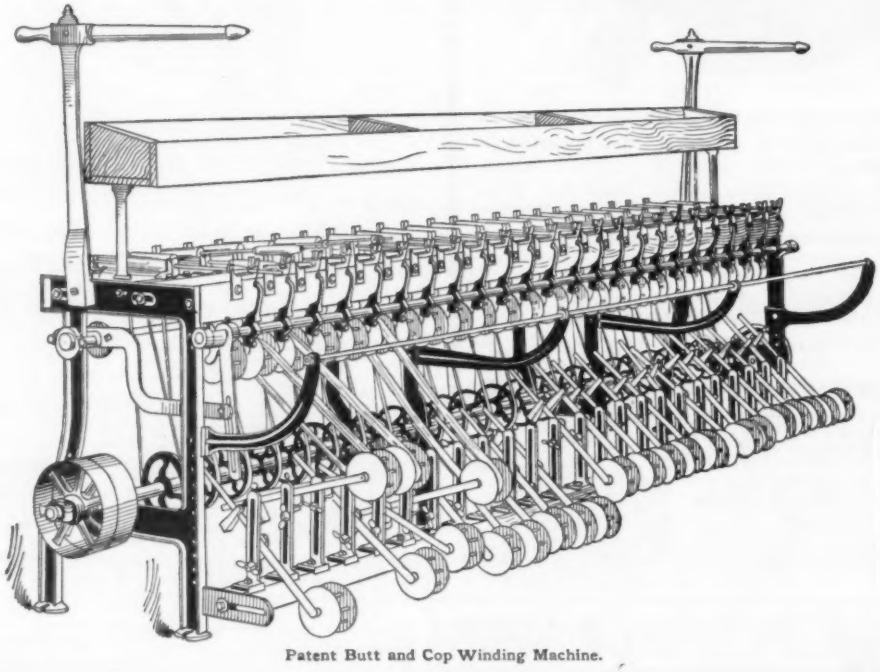


Patent Shuttle Bobbin Winder for Skeins, with Patent Variable Motion.



Patent Butt and Cop Winding Machine.

JACOB K. ALTEMUS,

2818 North 4th Street, PHILADELPHIA, PA.

FULL PARTICULARS ON APPLICATION.

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DYEING
DRYING
AND
FINISHING
MACHINERY

ARLINGTON MACHINE WORKS
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ARLINGTON HEIGHTS, MASS.
CONTINUOUS WET FINISHING MACHINES

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SEWING
MACHINES

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Send for Catalogue and Prices.

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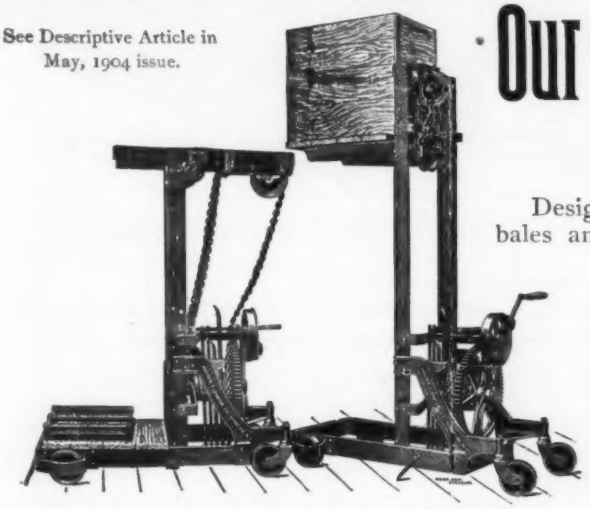

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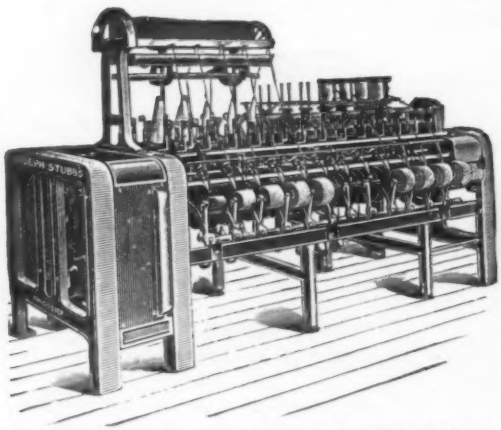

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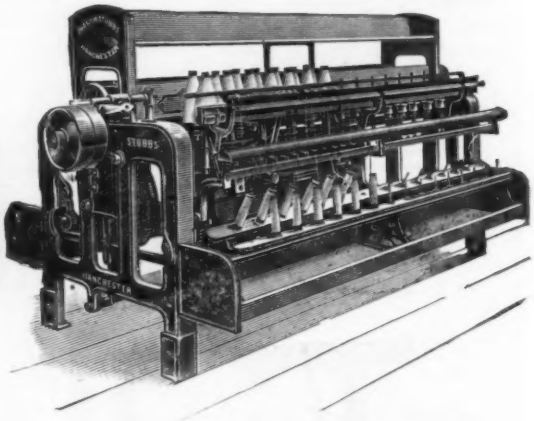

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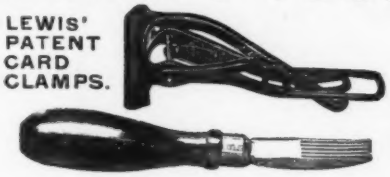

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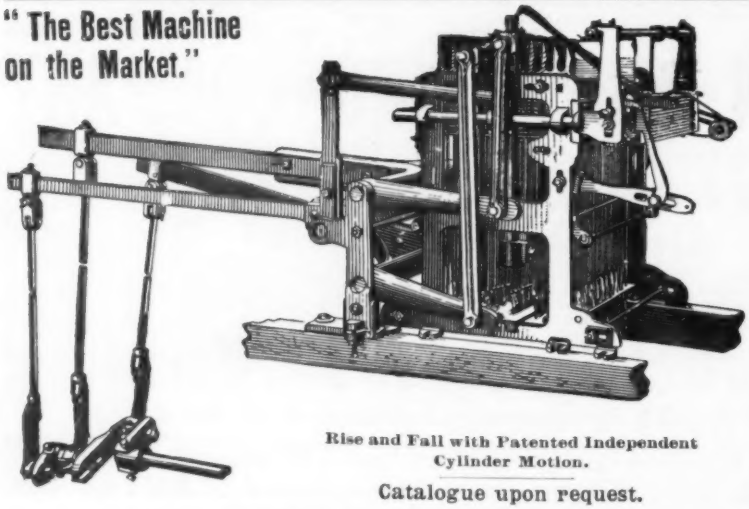

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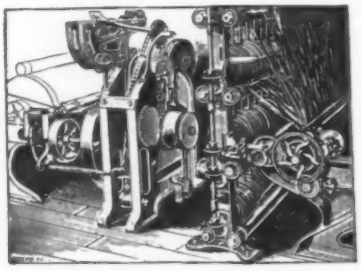

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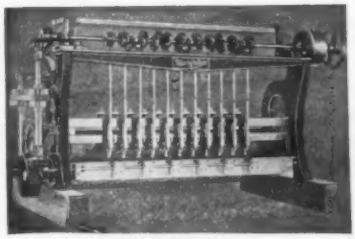

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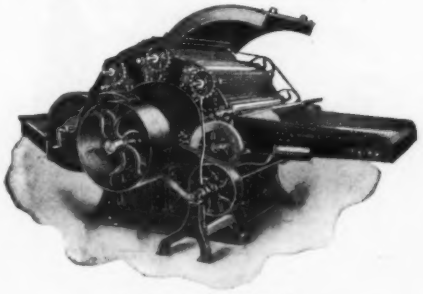

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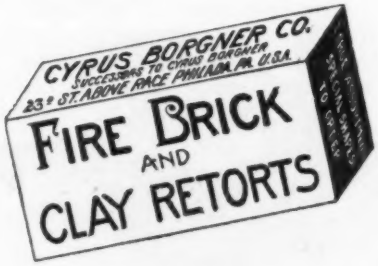

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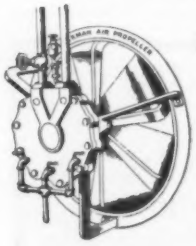

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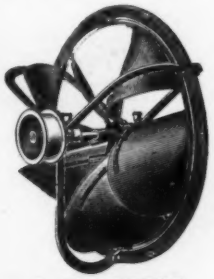

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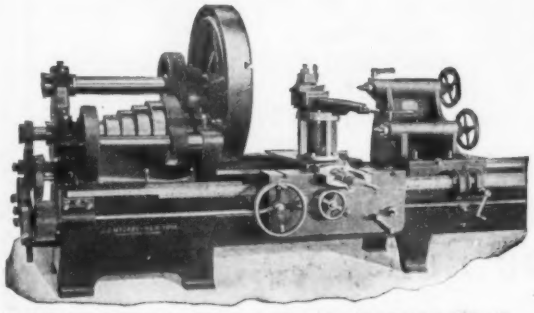

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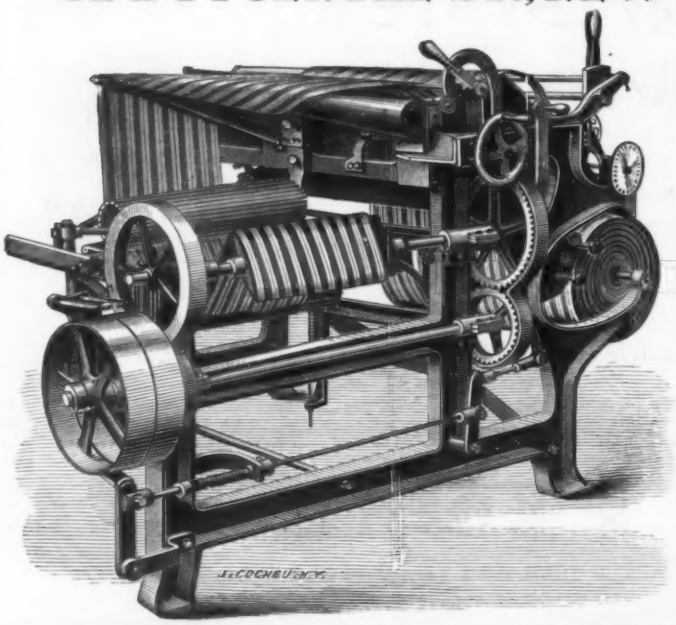

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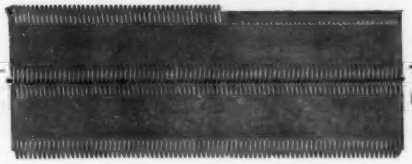

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FIG. 20.

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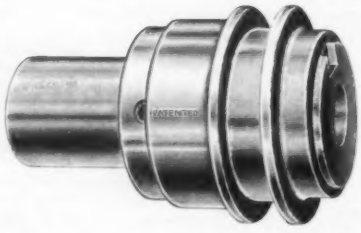

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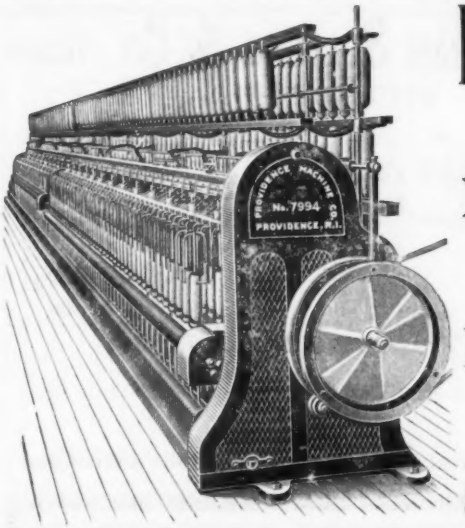

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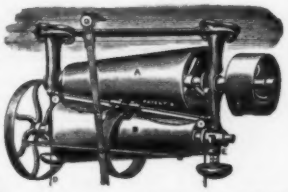

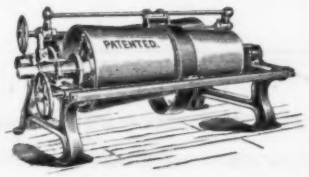

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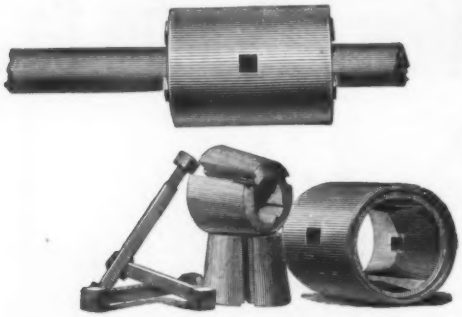

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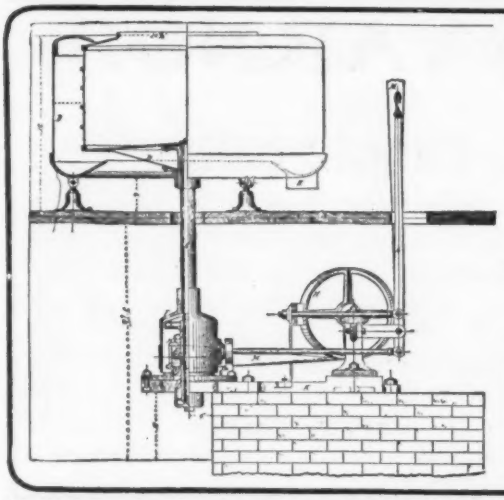

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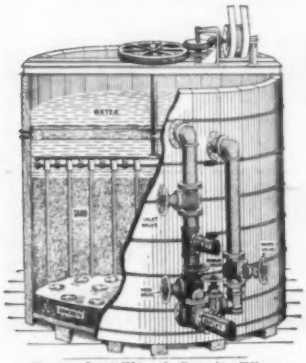

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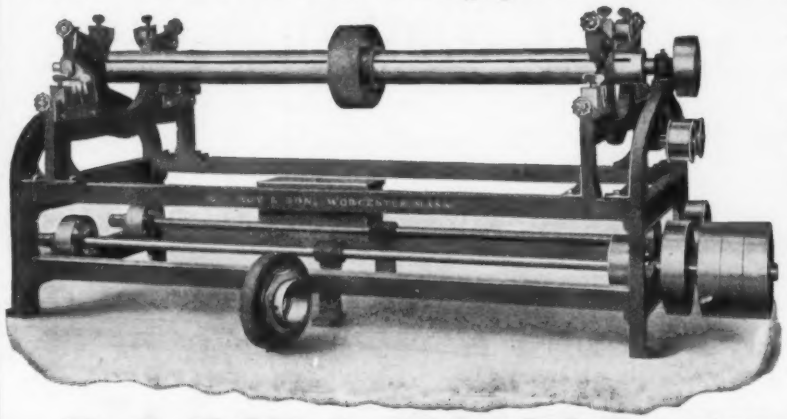

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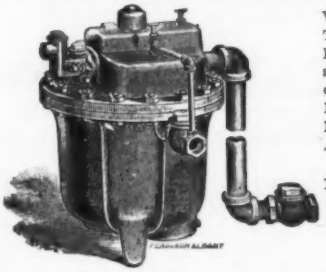

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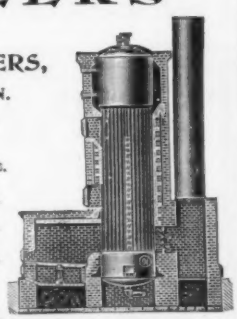

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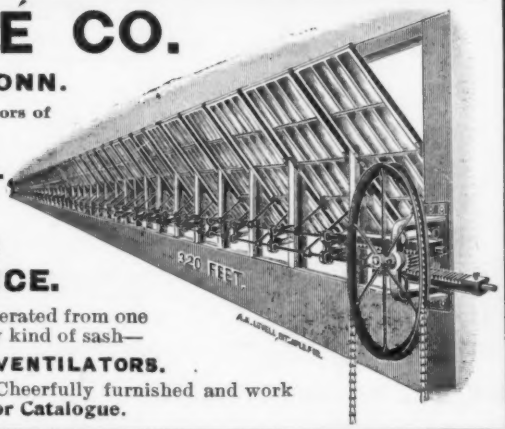

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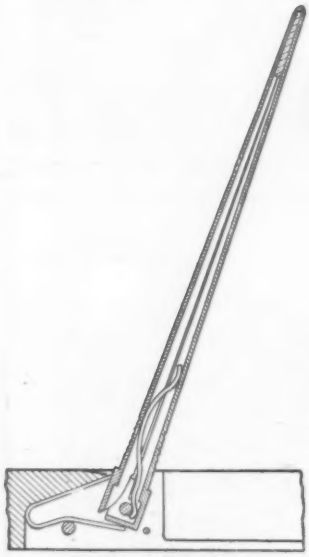

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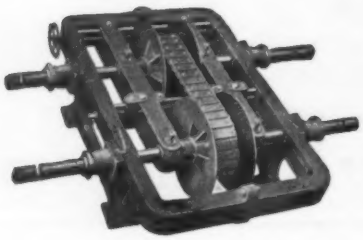

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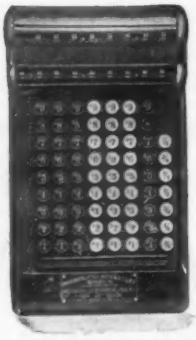

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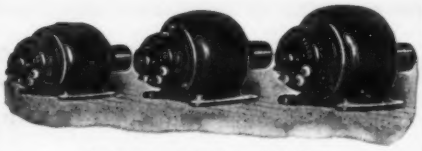

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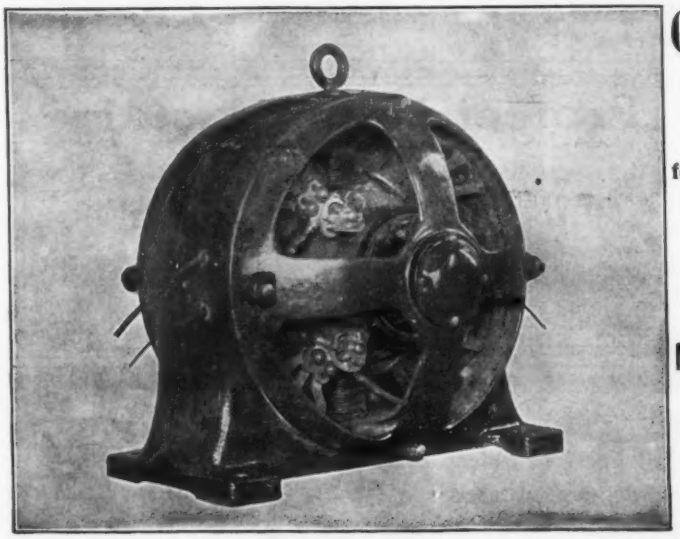

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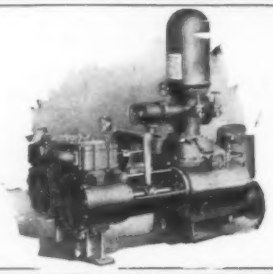

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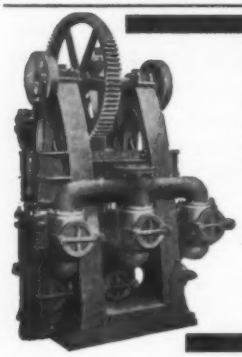

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Catalogue sent upon application.

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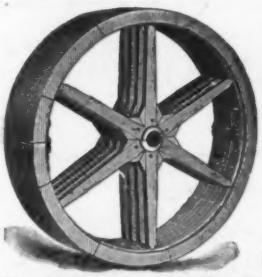

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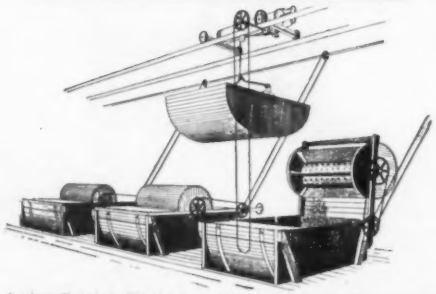

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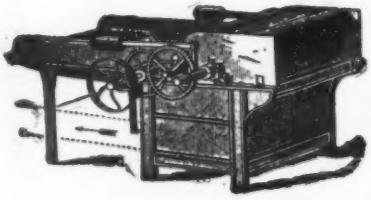

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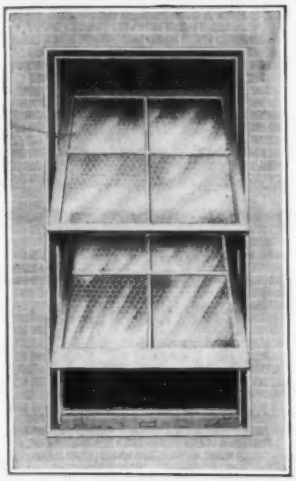

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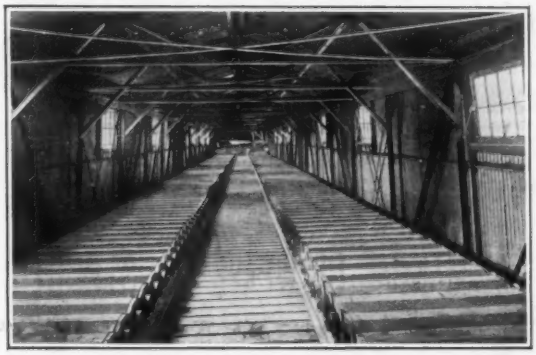

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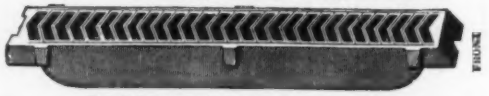

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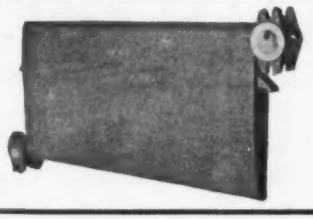

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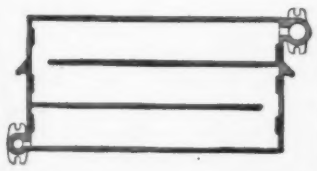

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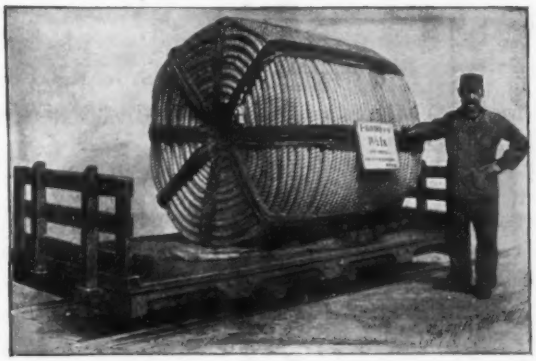

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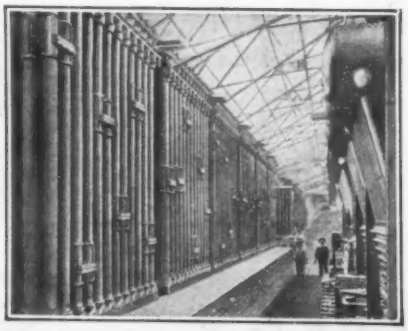

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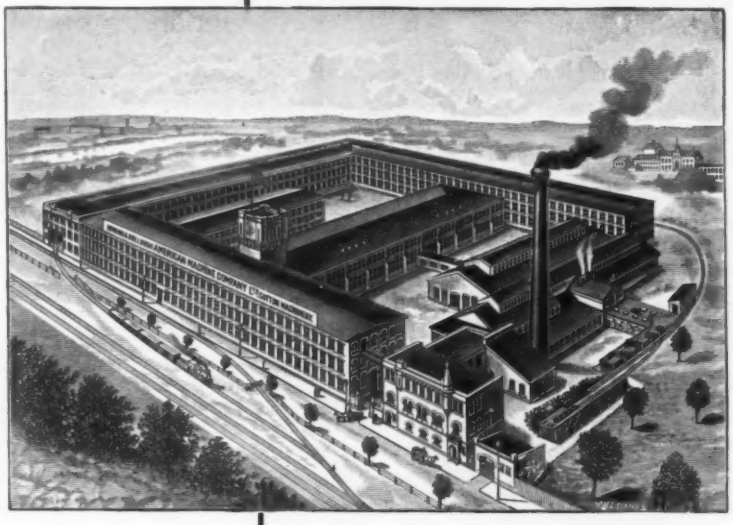

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Monthly Comment.

Wages and the Print Cloths.

At the beginning of the strike at Fall River on July 25, cotton was selling at 11 1/8 cents for middling uplands, and print cloth at 3 1/4 cents for regulars. These quotations gave a margin at $0.506, calculated as follows:

45 yds. cloth at 3 1/8c.....	$1.406
8 lbs. cotton at 11 1/4c.....	.90
Margin, July 25, 1904.....	$0.506

At the end of five months the new year began with the strikers still out, but with market conditions materially different, cotton selling at about 7 cents and print cloth at 2 3/4 cents. These changes have increased the nominal margin to .678, as follows:

45 yds. cloth at 2 3/4c.....	$1.238
8 lbs. cotton at 7c.....	.56
Margin, Jan. 1, 1905.....	$0.678

The margin and wage level have fluctuated at Fall River since 1884 as follows:

	Weaving	Cotton	Cloth	Margin
Feb. 4, 1884....	18.50	10 12/16	3 10/16	.77
Jan. 19, 1885....	16.50	11 1/16	3 3/16	.55
Mar. 1, 1886....	18.15	8 15/16	3 3/16	.72
Feb. 13, 1888....	19.00	10 10/16	4	.95
Jul. 11, 1892....	19.60	7 15/16	3 6/16	.94
Dec. 5, 1892....	21.00	9 9/16	4 1/16	1.07
Sep. 11, 1893....	18.00	7 3/16	2 12/16	.66
Aug. 30, 1894....	16.00	6 15/16	2 10/16	.63
Apr. 22, 1895....	18.00	6 15/16	2 12/16	.68
Jan. 1, 1898....	16.00	5 14/16	2 4/16	.54
Feb. 27, 1899....	18.00	6 8/16	2 12/16	.71¾
Dec. 11, 1899....	19.80	7 11/16	3 4/16	.84½
Mar. 17, 1902....	21.78	9 2/16	3	.59
Nov. 3, 1903....	19.80	11 4/16	3 4/16	.56
Jul. 25, 1904....	19.80	11 4/16	3 2/16	.506
Jan. 1, 1905....	19.80	7	2 12/16	.678

Shoddy in the Maritime Provinces.

At the meeting of the Maritime Board of Trade, held at Moncton, N. B., on August 17, 1904, the following resolution was adopted:

> Whereas, The Maritime Provinces are eminently adapted to the wool raising industry, and woolen cloths at times manufactured contain inferior substances,
>
> Therefore resolved, That it is desirable that the Government be requested to place such restrictions on manufacturers that will compel all woolen fabrics to be plainly marked as to proportion of pure wool or adulterations therein contained, in a manner similar to the legal restrictions placed by Government on manufactured imitation of dairy products such as oleomargarine, filled cheese, etc.

The ambiguity of this resolution is accidental, not intentional. Back of the sentence "it is desirable that the Government be requested to place restrictions on manufacturers that will compel woolen fabrics to be marked as to proportion of pure wool or adulterations," is the honest conviction on the part of the Maritime Board of Trade that such restrictions are possible and should be

imposed because the wool grower and consumer are being defrauded by the use of shoddy in the place of wool; the grower by the reduction in the price of wool; the consumer by the inferiority of the clothing he wears.

This sincerity of the Maritime Board of Trade is possible only by reason of a total misconception of the nature of textile materials and their relations to the necessities of the human race. Oleomargarine and filled cheese can be detected by chemical tests because the problem in each case is to distinguish two different chemical compounds,—oleo from butter, lard from cheese. In the case of textile materials chemical tests will distinguish animal from vegetable fibres, such as cotton, linen or hemp from wool or silk; with less accuracy, wool from silk. To expect, however, that cotton can be distinguished from cotton, as for example, Georgia cotton from Texas cotton, by chemical or physical means is nonsense which no one would spurn with greater contempt than the practical men who compose the Maritime Board of Trade. The proposition to distinguish wool from shoddy is no less absurd, for shoddy is wool. Such a distinguishing test is everlastingly impossible, and it is against shoddy that all resolutions like the one quoted are aimed.

Nor is this impossibility a cause of regret. Shoddy is reworked wool. Some shoddy is inferior to some wool, and certain grades of wool are inferior to certain kinds of shoddy. There is no line of distinction between shoddy and wool, and a test for distinguishing the two is no more desirable than a test for distinguishing six months' Texas from twelve months' California wool.

Moreover to rail at shoddy as an adulterant or to denounce its use as an outrage is to oppose the use of a material that makes human life possible in the temperate and frigid zones. The world's annual production of sheep's wool amounts to 19 ounces per capita of the population outside of the tropics. If used but once it would give each person about 13 ounces of cloth. This would have to serve for a year's supply for underclothing, outer clothing, stockings, hats, caps, carpets, bedclothes and all the manifold uses to which wool is put. The mere statement of this fact proves that a substitute must be found for woolen clothing in order to keep the population of the globe alive outside of the tropics. This necessity for more wool than the sheep produce is supplied to a limited extent by the skins of beasts, the hair of cows, camels, goats, rabbits and other animals, but chiefly by using wool more than once, that is, by converting worn out clothing into what is known as shoddy, which is then remade into new clothing. In this way and in this way only are all the people of the earth clothed and life made possible. There are but few notable exceptions to this rule, the Chinese in Manchuria, for example, who manage to exist in a cold climate clothed chiefly in cotton, but this is due to centuries of poverty and a gradual hardening of the system to exposure. However, we are considering American and not Asiatic standards of living and will leave the Chinese out of the question.

It is plain, therefore, that the shoddy which the Maritime Board of Trade denounce by implication, is essential to the maintenance of the greater part of the human race. In no quarter of the globe is it more essential than in the Maritime Provinces, exposed as they are to a cold climate made still more severe by the proximity to the Atlantic Ocean.

The Maritime Board of Trade is mistaken, but its error is based on a commendable hatred of sham and adulteration of commercial products. Its energies should be directed toward the exposure of shams that exist in fact and not in the imagination. For example, the trade in raw and partly manufactured wool is afflicted with the practice by many dealers of loading the wool with an excessive amount of moisture by which the buyer pays for wool and receives water. Is not this a better field for the Maritime campaign against fraud?

Under the preferential tariff England is sending cloth made of shoddy to the Maritime Provinces, where it is worn as all wool; and the Maritime Provinces are sending several kinds of dried fish to England where they are consumed and believed to be codfish. An exchange of cheap food for cheap clothing. Let the Maritime Board of Trade cheer up. Life in the Provinces is not altogether onesided.

The Dyeing of Oriental Rugs.

Owing to the popularity of Oriental rugs, the following order, issued by the Governor-General of Algeria to the three prefects of Alger, Oran and Constantine in regard to the manufacture of so-called Arabian carpets, will be of general interest:

Last year I asked you to advise the directors of schools which include instruction in the manufacture of Arabian carpets in their courses, to use for coloring the wool vegetable dyes only to the exclusion of all aniline dyes. My office has been engaged in compiling a manual containing useful directions for the preparation, spinning and dyeing of wool. This manual will be distributed to directors of schools and to all persons engaged in the manufacture of carpets and rugs and of other woolen products. They should teach the people that it is for their interest to use only vegetable dyes for coloring wool. By this means they will increase the value of their merchandise and be able to sell it more easily, as the public appreciate not only the beauty, but also the durability of the designs. I am, moreover, encouraging those natives who follow instructions in this respect. The products colored with vegetable dyes will receive premiums to be awarded after examination by the director of the School of Fine Arts at Algiers. I will likewise encourage those who make tests in the cultivation of tinctorial plants.

Unfair Competition.

Judge Platt of the U. S. District Court of Connecticut in a recent decision states in unmistakable terms the rights of a manufacturer to the exclusive use of designs in machinery by which the trade have become accustomed to distinguish his product. These rights may be independent of patents or copyrights.

The general principles on which the decision is based are of much importance in the textile trade, although the case in question related to the manufacture of coffee mills. The Enterprise Mfg. Co. has manufactured coffee mills of a certain design, color and finish continuously since 1866, designating seven sizes by the figures 0, 1, 2, 3, 5, 7 and 9. The sales of the Enterprise mills amounted to $75,000 in the year preceding the beginning of the suit. Landers, Frary and Clark placed on the market a coffee mill identical with the Enterprise mill in size, form, color and finish, and designated the sizes by the numbers 01, 11, 20, 30, 50, 70 and 90. The Enterprise Co. retained Howson & Howson as attorneys and began suit against the Landers firm to prevent the imitation of the Enterprise mills. The defendants did not deny the facts as stated by the plaintiff, but asserted that in the absence of any patent the Enterprise mills could be manufactured by any one who chose to do so, and that they, the defendants, proposed to continue to copy the mills and thus prevent the Enterprise Co. from perpetuating a monopoly which was not protected by any legal right.

The court was so deeply impressed with the unfair competition of the defendant that it decided in favor of the Enterprise Co. in an opinion whose language is unusually strong for a judicial decision, and from which we make the following extracts:

The complainant's mills, which are known throughout the trade as "Enterprise" mills, have attained a very high reputation and are the leading coffee mills on the market. The long-continued and uninterrupted use by complainant and its predecessor, without change, of the characteristic shape, design, coloring and decoration of said mills have caused the characteristic appearance of the Enterprise mills to be well known to the trade, and Enterprise mills are recognized by the trade by reason of their unique appearance.

Defendant, shortly before the filing of the bill in this case, after examining complainant's line of coffee mills, concluded to enter for the first time upon the manufacture of the same line of hardware and sell it in competition with complainant.

The defendant therefore commenced the manufacture of coffee mills, using parts of mills sold by the plaintiff as patterns wherever it was convenient or profitable to do so. It is now making and selling coffee mills which in all substantial respects are the same goods as those made and sold by the plaintiff, and intends to make other mills with the later style of hopper which will be substantially the same goods as those made and sold by the plaintiff.

The fallacy of the defendant's contention is evident, and I am entitled to no particular credit for pointing it out, because numerous judges have called attention to a like fallacy heretofore. The plaintiff claims no monopoly in the manufacture and sale of coffee mills. The world at large and its products are open to the defendant. It can ransack the universe, and avoiding possible patents, put together and market what it will in the way of coffee mills, with this one exception, it shall not so arrange its materials and so dress its goods as to produce and market a coffee mill which will be liable to be mistaken for the mills upon which, by long and persistent efforts, the plaintiff has been enabled to obtain a distinctive reputation.

The whole case resolves itself down to this. Has the defendant, by placing its name in some instances, and in others, its initials, upon its coffee mills in the manner shown, sufficiently distinguished them so that likelihood of misconception by the ordinary purchaser, acting in the ordinary

way, is eliminated? It fails to prevent one customer from sending the defendant's mill to the plaintiff for repairs, and such a demonstration of fact is worth any amount of hypothesis.

If the defendant was excessively anxious to keep off the plaintiff's territory, why did it not make some change in color, configuration or design? The confusion could have been avoided with ease. He prepared the couch with eyes wide open and he ought to occupy it now with grace.

The injunction should be broad enough so that, while not interfering with the inherent right of the defendant to make coffee mills of such design, shape and dress as it may please to employ, it will prevent said defendant from marketing a mill not only such as it now markets and threatens to market, but any mill, which by reason of its shape, design and arrangement of color and number, shall so resemble the coffee mills of the plaintiff as to be likely to create a misapprehension in the minds of the purchasing public of average intelligence, and to tend to lead the ordinary consumer to mistake the mills of the defendant for the mills of the plaintiff.

Let an injunction issue in accordance with this opinion, and let the matter go to a master for an accounting.

Woolen Goods.

In this issue appears the report of the government analyst of Victoria on the adulteration of woolen clothing sold in Melbourne and suburbs. It is chiefly interesting as showing the effect produced in an agricultural community by the discovery that clothing containing cotton is commonly sold as "woolen." In that distant continent, where neither the hum of the spindle nor the clatter of the loom is heard, the buyers of textiles evidently believe that the commercial term "woolen" means "all wool." Rightly or wrongly the textile trade has given another meaning to the word. If cotton is mixed with wool in the raw state and the resulting mixture is manufactured into fabrics, the goods are ordinarily called "woolen." Possibly an intention to deceive was originally responsible in part for this change in the meaning of the word, but another and natural reason is found in the division of wool manufacturing into two distinct branches, the carded woolen and the worsted industries. Cotton is mixed in its raw state almost entirely by the carded woolen process and thus naturally the term "woolen" was applied to all products of that branch whether containing cotton or not.

If the cotton that is mixed with the wool is in the form of yarn, it is customary to designate the goods as "cotton warp," "cotton filling" or "containing a cotton thread." Goods made of all wool stock are called "all wool." This term is applied very properly to all fabrics made of wool material, whether the raw material consisted of wool direct from the sheep's back or of wool stock obtained from rags and which is ordinarily called shoddy. This word shoddy is popularly used to convey the idea of fraud and cheating, and thus much undeserved discredit rests upon reclaimed wool, which is one of the most useful of products. The French and Germans are more just in designating reclaimed wool. The former call it "laine renaissance," regenerated wool; the latter "Kunstwolle," artificial wool.

There is no commercial term to designate goods made entirely from wool direct from the sheep's back. This is probably due to the fact that, strictly speaking, no such goods are made. The nearest approach is found in worsted goods which are made by a process in which mixtures of wool with foreign material such as cotton are used so little as to be commercially negligible. Even in the case of worsted, however, the practice of reworking card waste, broken top and slubbing is so common as to make it extremely improbable that any worsted goods are made entirely of wool direct from the sheep's back.

These explanations of the commercial terms used to designate textile manufactures show how the trade have departed from the original meaning of the words. The latter meanings are well understood in textile manufacturing countries like our own. The indignation expressed in the very interesting report of the government analyst for Victoria that "woolen" goods should contain cotton is in great measure due to a misunderstanding of the modern meaning of the word "woolen." Doubtless an investigation of the original meaning of many words in our language would disclose even more striking changes from the original signification.

It is natural that the inhabitants of a country like Australia, which produces vast quantities of wool and no shoddy whatever, should accept the original meaning of the word "woolen." They should recognize, however,

that notwithstanding the immense production of wool the world's entire product of that staple would give each inhabitant but one square yard or 13 ounces of cloth for a year's supply of clothing; that the existence of the human race in temperate and cold climates is, therefore, dependent upon the mixture of shoddy and cotton with wool; and that common usage, which is often more powerful than law, has in trade applied the word "woolen" to these mixtures.

Cotton Goods in the Philippines.

The cotton goods imported into the Philippines during the year ending June, 1904, were valued at $4,904,204, of which only 6 1/2 per cent. came from the United States. The classification, according to countries of origin, is as follows:

Great Britain	45.05 per cent.
Spain	15.48 per cent.
Switzerland	7.29 per cent.
British E. I.	7.27 per cent.
United States	6.52 per cent.
Germany	5.64 per cent.
Japan	3.89 per cent.
France	1.82 per cent.
Other	7.04 per cent.

These goods were classified as follows:—

Cloths	$2,433,224
Muslins	659,252
Wearing apparel	199,697
Carpets	463
Yarn and thread	779,910
Quiltings	23,104
Velveteens	13,866
Tulles and laces	50,470
Knit goods	594,308
All other	149,910
	$4,904,204

With the possible exception of the tulles and laces, all of these goods, valued at nearly $5,000,000, can be supplied by the mills of the United States. As a matter of fact the portion supplied by this country amounted to only $320,000. In view of the close political relations between the Philippines and the United States, this condition of the cotton goods trade is a glaring anomaly. It is idle to talk of negotiating reciprocity treaties with Canada, France, the Argentine Republic or any other country as long as we do not adopt a reciprocal trade policy with our own colonies.

The imports of cotton goods into the Philippines fairly represents the consumption of such goods in the archipelago, because the Philippine textile industry is nearly a negligible factor. Based on a population of 10,000,000, the per capita consumption of cotton goods in the islands amounts to 49 cents, as compared with $4.38 in the United States. The difference is due to the poverty of the Filipinos and to the smaller need of clothing in the tropics. The poverty of the people can be and will be remedied. The climate will remain unchanged, but the clothing of the dwellers in the tropics consists mainly of cotton. Among the first signs of approaching civilization is a demand for cotton cloth. Bearing in mind the lessened requirements for clothing, it is not an extravagant estimate that the development of the Philippines will eventually bring the per capita consumption of cotton goods to at least 50 per cent. of the present amount in the United States. Making no allowance for an increase in the population of the islands, this would give a total annual consumption of cotton products of $22,000,000, all of which under proper tariff regulations should be manufactured in American mills.

The reduction of duties on Philippine products coming into the United States is reasonable and necessary. There is slight objection to the proposition and none at all that is reasonable. But after giving the Filipinos independence, lifting them up to the level of Anglo-Saxon civilization at a vast expenditure of blood and money, and then giving their products access to the best and largest market on earth, it is asking but little in return that our products should have access to their market. No proposition in reciprocity could be more moderate.

Created an Industrial Boom.

The Chestnut Hill mill district in East Killingly, Conn., is enjoying something of an industrial boom and revival of prosperity. This is one of the oldest textile manufacturing districts in New England. Last year we published some very interesting illustrated articles on this historic district, wholly with the idea of general interest to many of our readers who were reared in that section and who have pleasant associations with it. It is a pleasure to learn that these articles have been instrumental in leading to the establishment of several important industries. In commenting upon the revival in prosperity, The Windham County Transcript says: "Mr. James N. Tucker's articles in the Textile World Record, in which he so beautifully and ably portrayed the history and advantages of this village, with which nature has been so kind, has brought the attention of the whole manufacturing world to its advantages."

Imports of Wool.

For the ten months ending October, 1904, the wool imported into this country amounted to 153,302,385 pounds, valued at $23,410,354. The weight of the wool imported for this period is almost exactly the same as for the corresponding period last year when it amounted to 153,423,550 pounds, valued at $20,074,506. The imports for the corresponding ten months of 1902 were 148,779,572 pounds, valued at $16,413,426.

The increase in the value for the current year is due to the greater proportion of first and second class wools, there having been 65,038,271 pounds of these two classes for the ten months of 1904, as compared with 48,070,386 pounds for the ten months of 1903. This increase of 17,000,000 pounds is balanced by a decrease of the same amount in the imports of third class or carpet wool which for the ten months of 1903 amounted to 105,352,714 pounds and in the corresponding period in the current year to 88,264,114 pounds.

The imports of manufactured woolens show a gratifying decrease, amounting for the ten months ending October, 1904, to $13,458,571 as compared with $16,776,354 in 1903.

Silk Filatures in China.

The following list of silk filatures operated in China on the European system, together with the number bassines in each, is given in a recent issue of the Bollettino di Sericoltura. The first eight on the list are managed by Italians; all the others by Chinese.

Filature.	Trade Mark.	Bassines.	Location.
Ewo		500	—
Sing Chong	Factory	530	Shanghai
Soy Lun	Anchor	480	—
Lun Wha	Double Dragon	804	—
Kee Chong	Flag	544	—
Jeay Kong	Sans Pareil	328	—
Jin Chong	Gold Drown	208	—
Soy Zun	Eagle	336	—
Hungkee	Tiger	180	—
Tsun Wo	Mulberry tree and web	128	—
Chin Wha	Worm leaf and cocon	296	—
Gee Zun	Excelsior	300	—
Tchen Lun	Gold Flying Tiger	240	—
Youngtai	Gold Globe (2 filat.)	480	—
		416	—
Tsun Chong	Double Anchor	208	—
King Lun	Double Horse	240	—
Wha Fong	Two Riding Joss	200	—
Changkee	Double Tiger	240	—
Wei Yuen	Steam boat	302	—
Sze King	Gold Cocoon	208	—
Jeay Fong Chang	Unicorn	140	—
Sœy King	Double Lion	300	—
Nei Kee	Geyser	306	—
Chang Shing	Five Tigers	266	—
Yah Shing	Hero and Tiger	196	—
Singtse	Lion	300	Shaoshing
Ha Ji Wo	Two Gods	300	—
Dah Lun	Stork	276	Hangchow
Wha Fong	Two Riding Joss	214	Soochow
Woo Sing	Sun	200	—
Sooking	Woman and Loom	336	—
Hupeh	Imperial Dragon	208	Hupeh
Sze King	Double Horse	200	Chinkiang
	Total	10,410	

The United States supplies 80 per cent. of the cotton used in the mills of Europe and America.

There were exported from the United States in the year ending June 30, 1903, cotton goods to the value of $32,216,304. In the year ending August 31, 1903, Great Britain's exports of the same product amounted to $271,418,227.

Seasonable Fabrics.

MEN'S WEAR.

In general the situation as regards men's wear is fair. The clothier is not buying in bulk this season, any more than for a number of years past, but on lines that have been opened for the next heavy-weight season a good amount of business has been transacted. There has been a tendency on the part of the larger manufacturers, notably the American Woolen Company, to hold back the higher grades of overcoatings, and in consequence the sales have been largely limited to goods ranging from 74 1/2 cents to $1.25. There seems to be a more general inclination to test a wide range of fabrics and styles than in the past, and in consequence sample piece orders have been generally distributed. Many buyers are not yet willing to operate, and, therefore, are holding out as long as possible, in the hope that by so doing they may influence prices in their favor. The contention is made that the manufacturers have missed an opportunity for a good round advance in prices, warranted by the condition of the raw material. The manufacturer's policy has been to market only a limited portion of his product at the opening price, and then to advance quotations. In certain instances this has already been done, sellers disposing of all they could afford at the opening figure, and then advancing the price 2 1/2 to 5 cents.

In overcoatings, general lines are being operated on with extreme care. Reports of other than satisfactory business seem rare, all things considered. Some buyers have placed orders that they do not intend to honor, and the opening of subsequent lines may result in a disposition to change original orders.

The principal feature of the overcoating market is the tendency toward fancies, especially in the cheaper grades of goods. In medium to better styles the plain staple fabric has its place, and yet there is some doubt as to certain styles, especially the melton. Both in overcoatings and suitings this fabric is regarded as likely to play an unimportant part as compared with kerseys and rough fabrics in the higher grades.

In suitings cotton warp cassimeres and cotton carded goods hold attention, and the ultimate decision of the clothier as to their respective merits remains to be given. The opening of better grade goods was by general consent deferred until after the first of the new year.

In worsteds there is little outside of prophecy. The situation in light weights, however, is said to be strong enough to warrant the manufacturer in believing he can hold for at least part of the advance which he has been obliged to pay for raw material. More or less secret dealing is said to have been going on with larger buyers on special work. It seems to be a question with many whether the mercerized fabric will not be overdone or cheapened to a price which will make it more or less unsatisfactory as far as wearing qualities and intrinsic merit are concerned.

The expected advance on the product of the American Woolen Company mills materialized, but was not as radical as expected in most quarters. In rough overcoatings, fancy meltons and wools cheviots as well as thibets it ranged from 2 1/2 to 7 cents. Two lines of thibets made by the Burlington mill were opened as follows: S 703, 17 to 18 ounces, 72 1/2 cents; new and S 512, 18 to 19 ounces, 75 cents. The same fabric was opened last year at 72 1/2 cents, advanced to 75 cents and subsequently to 77 1/2 cents.

Among the most popular numbers opened were two lines from the Ray mill at 77 cents and 97 1/2 cents; a fancy twist cheviot from the Vassalboro mill at 92 1/2 cents; a line of piece dye fabrics from the Bay State mill from 80 cents to 107 1/2 cents; two numbers from the Sawyer mill at $1.37 1/2 and $1.50. In the Weybosset lines prices run from $1.15 to $1.60, and in the Chase from $1.35 to $1.87 1/2.

The prices of some of their plain fabrics:

OVERCOATINGS.

Style	New.	Last year.
Z 409 black	$0.85	$0.80
410 mixed	0.90	0.85
479 black	0.90	0.85
479 mixed	0.95	0.87½
I 4530 mixed	1.17½	1.10
X 233 black	1.25	1.22½
I 8130	1.57½	1.55
8230	1.57½	1.55
A 3128 mixed	1.75	1.57½
F 3157 black	1.77½	1.57½
A 1128 mixed	2.77½	2.70

FANCY MELTONS.

S 531 range	$1.12½	$1.07½

THIBETS.

Style.	Present.	Spring, 1905.	Fall, 1904
I 4818	$0.95	$0.87½	$0.85
8818	1.00	0.90	0.60
S 50½	1.05	1.02½	1.00
I 3013	1.15	1.15	1.10
7218	1.27½	1.25	1.20
5018	1.62½	Not shown	1.67½

W. W. Capers, Jr., opened lines of fancy overcoatings from 80 cents to $1.07 1/2, the latter line being favorably commented on by the trade. These goods are strictly new, and consequently comparisons with last year are impossible. The most notable of them is a brown fabric, all wool, with the exception of a few twist threads used for overplaiding and stripe effects.

Stevens, Sanford & Jordan have advanced the Rivulet fancy overcoatings from 35 to 37 1/2 cents, and Oxford meltons from 20 to 21 cents. Greeley, Cushman & Record have opened the Pittsfield double and twist suitings at $1.50. Deering, Milliken & Co. have opened Worumbo overcoatings at prices ranging from $1.67 1/2 to $4.50. Belondery double and twist suitings have been opened by McCoy and Warner at 95 cents and 97 1/2 cents. F. L. Wendell has opened lines of fancy overcoatings at 72 1/2 cents and 75 cents, and they have been received with marked favor. The Housatonic fancy overcoatings have been opened by James & E. H. Wilson at from $1.10 to $1.35. The prices quoted show the wide range of the market, and demonstrate the divergency of taste shown in purchases.

DRESS GOODS.

Sales of staple goods in the cheaper grades constituted the bulk of the dress goods business in December, and this at an advance. It is hardly proper to call such business seasonable, but it remains the feature. Even in these goods an advance has been registered, and although on better grades of fabrics intimations are that the advance will not be large, it is freely claimed that only a small proportion of the product will be sold at the opening prices, and that these will be the lowest of the season. Buyers appreciate that the same qualtity of fabric will not be offered in 1905 at the prices that ruled in 1904. Yet all through December they were inclined to proceed slowly, knowing that they would have to pay more.

In mohair lines the manufacturer is cautious about preparing for the fall season. There seems to be a general feeling that on domestic product for the next fall season it is the part of wisdom to proceed cautiously. The matter of the cheviot is occupying the minds of sellers. Early in the fall there seemed to be a feeling that cheviots would prove large sellers, but trade fell off sharply, and although the cutting up trade states it believes there will be a certain amount of cheviots used in spring garments, operations are just now restricted and covering a less period than usual. There is no large stock of goods on hand.

The call for worsted fabrics for the new season has already begun, buyers making inquiry for advance prices on these goods. With a great many cutters the efforts to get an early showing of dress goods for next fall are based upon a desire to get at the market average on goods so that they may be in a position to place substantial initial orders.

On business from cutters and jobbers in the form of reorders mills are getting a volume of trade that is up to the average for the season. The yardage of worsteds and mohairs for spring has reached large proportions. No cancellations are reported. Eoliennes have taken a conspicuous position in the spring business and also for late demands for this winter. They seem to have, in large degree, taken the place of other fabrics, especially voiles. Orders for spring include voiles in black and white and other colors, but are not up to the volume of a year ago.

There is an active demand for tan coverts, waterproofed. Many mills are sold up well into 1905. One plant is under orders until next September. Prices have advanced. A

certain amount of business has been done at 2 1/2 cents advance on medium grades of goods and at this moderate rise buyers have been persuaded to cover themselves for a considerable period. Lines at 32 1/2 cents have been sold at 37 1/2 cents and 65 cent goods at 70 cents.

An attractive line in zephyrine suitings is offered by Ostrander & Co. for the Barnaby Mills. The same firm is showing for the same mills showy lines in Scotch plaids and embroidered suitings.

SILKS.

In silks, slightly better prices are being realized. No large advances have been obtained on any class of goods, but 1 to 2 cents more per yard have been asked and paid for some desirable silks. Manufacturers who gave their customers the opportunity to place orders early in the season are not now disposed to make the same proposition.

Buyers arriving late in the month found some of the most desirable lines entirely bought up, and stiffer prices asked for others. Quite a number of manufacturers of taffetas have taken all the orders they can fill and are refusing new business. One well known line is sold right through to May. There are still a number of mills, however, that are looking for new business.

So many new effects in changeable and novel colorings have been brought out in taffetas that the old time buyer almost fails to recognize old and well known staple fabrics. Both crepe de chine and, as stated, colienne costumes will be largely worn for spring, favored shades being brown, gray and what is termed hyacinth blue. Shantung silks, both natural and dyed, are good property and habutais are already in a commanding position. Tussahs, both imported and domestic, are being used to quite an extent, largely for automobile costumes to be worn next summer. The domestic production has so improved that liberal orders are now being placed for these fabrics which not long ago it was hard to command a sale for at almost any price. In all lines the tendency is toward colors. Black goods are very plentiful. Brown is as popular as ever, and very large quantities are being manufactured.

AMERICAN RUSH MATTING.

BY CHARLES RICHARDS DODGE.

The Japanese floor mattings imported into this country are either produced from the rush known as Juncus effusus, the Bingo-i mat rush, or from Cyperus unitans, the Shichito-i mat rush, the matting from the first named being the more elegant and costly.

It is not generally known that a concern in Maine (the Goodall Matting Co.), is now weaving a fine grade of floor matting from the imported culms of the Juncus effusus. And it is of further interest to note that this species of mat rush is not only growing in California, as I am informed by Prof. Hilgard of the College of Agriculture at Berkeley, but that it has been experimented with in manufacture by the concern referred to, and that the experiments have demonstrated that the culms of J. effusus from the Pacific coast are superior in many respects to the imported Japanese.

It is now proposed to increase the culture of the species, and to introduce it into several of the more easterly States. Juncus robustus, a similar species, takes the place of effusus farther south in California, and it is thought that this species might answer very well for employment in cheaper grade matting. The imported culms cost $30 to $40 per ton. Based on an estimate of two tons to the acre, the growth of the mat rush at these prices might prove a profitable new industry, besides giving us an American made matting from home grown raw material. The labor question in this country, however, is a decided factor that must be considered.

The samples of matting sent me by the Maine manufacturers are of fine, even quality, very substantially woven, and must be quite durable. If it should be found possible to obtain the American product economically and in commercial quantity, great possibilities would be opened up for the floor matting industry in the United States, and we might expect other mills to be established in different sections where a supply of the raw material would be available.

Australia, the Home of the Merino Sheep.

BY GOLDSBROUGH, MORT & COMPANY.

This article was specially written for the Textile World Record and the Illustrations made from original photographs taken for that purpose. It was begun nearly a year ago, but its completion was delayed somewhat by the death of one of the members of the firm of Goldsbrough, Mort & Co. It was written by men on the spot who speak from personal knowledge.—*Ed.*

In this article it is proposed to trace briefly the history of squatting in Australia during the past century as well as the progress and development of the wool trade, and it is hoped that such resume may prove of general interest to our readers, whom we are sure will, after perusal, concede the appropriateness of the heading which has been adopted.

LANDING OF THE FIRST SHEEP.

This interesting event dates as far back as the year 1788, when 29 head were landed in Sydney from the ships which brought the first governor, Philip, to these shores. They were apparently the balance left from some ration sheep taken on board at the Cape. In 1791 it is further recorded that 68 head were landed as supplies for the new settlement, and five years later the number returned as then in the colony was 1531, evidencing an attempt on the part of the settlers at this early date to establish a flock. The market value in those days was £7, 10s. per head.

EARLY IMPORTATION OF STUDS.

In the year 1797, by which time the flocks numbered 3,902, the suitability of the country and climate for the production of sheep and wool had evidently been realized, and the first attempt to improve the breed was then made by the importation of a few pure Spanish merinos. These sheep, originally presented by the King of Spain to the Dutch Government in South Africa, were secured by the captains of two ships which had been sent from the new settlement to the Cape for provisions. They numbered 26 in all, but not more than half were safely landed in Sydney, and these were undoubtedly the origin of the pure merino in Australia.

CENTRAL AUSTRALIA BULLOCK TEAMS, LADEN WITH WOOL.

CAPTAIN MACARTHUR.

This small consignment was distributed or secured by one or two of the leading early settlers of those days, among them being Captain (afterwards Sir William) Macarthur,

whose name has since become prominent in the history of the merino sheep in Australia. In 1805 Macarthur, who had been home to England, returned to Australia, bringing with him four ewes and a ram, purchased by him from the stud of King George III., whose stud originally came from the royal flocks of Spain. The captain, having obtained a grant of 10,000 acres of land, which he named Camden Park, then settled down and established the Camden flock of merinos, which in after years made a great name for themselves, and the purity of which was never doubted. Camden Park was well adapted for sheep raising, as it is stated that in the year 1811 Captain Macarthur had, since he started breeding, raised a total of about 12,000 head, and his flock then numbered 4,600. From this date onward the flocks increased rapidly, and valuable importations were made from time to time.

INLAND RIVER STEAMERS AND BARGES, LADEN WITH WOOL, IN AUSTRALIA.

Tasmania was by this time rapidly developing, and the Van Diemans Land Company imported on a large scale. The sheep brought out by them formed in all probability the nucleus of the present Tasmanian stud flocks, which are held in such high esteem by all sheep breeders.

IMPORTATION OF VERMONT SHEEP.

The Australian breeder is nothing if not progressive, and many experiments have from time to time been made, with the view of obtaining the most profitable class of sheep possible. With this object importations of various breeds have taken place. The only one, however, which appears likely to make any large or lasting impression on the original descendants of the Spanish merino is the Vermont. The first importation of this breed was made in the year 1866 and consisted of two rams, sons of the famous American sire, "Old Grimes," whose name will in all probability be familiar to all American stud masters. It is generally understood that the two rams were introduced into the stud flock of one of our best known breeders of that day, and the progeny of which at the present day are recognized as being at the very top of stud flocks in Australia. Since the importation above referred to many large and costly importations of Vermont sheep have taken place, so much so that some of our largest flocks are at the present time strongly impregnated with Vermont blood. Despite this fact, however, and the fact that Vermonts, or sheep graded from them, carry off most of the honors of our leading shows, it still remains a moot point with the majority of breeders, whether the ultimate result of the cross will prove beneficial or otherwise.

FIRST EXPORTATION OF WOOL.

Although the history of the wool trade is dealt with elsewhere, it may not be out of place to mention at this stage that the first

bale of wool was shipped home from Sydney in the year 1807, while in 1808 two bales were sent. Prior to this, about the year 1800, Captain Macarthur had taken to England with him a small parcel of wool. In 1819 about 150 bales were shipped, and from that date onward the tables which are appended will clearly show the marvelous progress of this industry.

Table showing in pounds the progress of the wool trade from 1819 to 1903:

Year.	Weight in Pounds.
1819	71,299
1850	32,361,829
1860	59,166,616
1870	175,081,427
1880	300,240,128
1890	569,265,400
1903	387,970,440

IMPROVEMENTS IN WOOL GROWING CAPACITY OF SHEEP.

The marvelous strides made in the production of wool as proved by the above table are not altogether due to the gradual increase in the number of sheep, but in a very large degree to the skill displayed by breeders in developing a profitable animal by careful and judicious selection, the sheep of the present day carrying 100 per cent. more wool than those of 50 years ago. In many of the best flocks of today the average weight per head cut by grown sheep is up to eight pounds, some growing as high as ten pounds, and this includes breeding ewes. Excluding the latter the average would be still higher, wethers cutting up to twelve pounds. Lambs when six months old cut from two to three and a half pounds.

INCREASE OF SHEEP.

A table showing the gradual increase of the wool exported has already been given, and one is now appended showing how the numbers of sheep varied, taking periods of 20 years:

Year.	Number.
1800	6,124
1820	156,202
1840	4,305,387
1861	23,741,706
1881	65,078,341
1891	106,419,751
1902	53,988,559

The highest point was reached in the year 1891, as shown above, ten years later (1901), owing to the culmination of the most severe drought ever known, lasting for a period of eight years over almost the whole continent, statistics show a decrease of 33,340,695, while for the year 1901-02 alone the enormous loss of 18,090,497 was sustained—thus reducing the total number in 12 years by 52,431,192, or nearly 50 per cent. of the highest number reached. It may not be out of place, however, to add that the drought has ended and the corner turned, and the numbers are gradually increasing.

So far as an article necessarily limited will allow, an endeavor has been made to give in a few pages a history of the progress of the merino sheep in Australia. Before concluding, some remarks as to the working of sheep on station properties, and the methods by which our pastoral industry has arrived at its present position may not be found out of place.

It may be said that in the year 1891 squatting in Australia reached its highest point, so far as production is concerned. In that year the sheep numbered 106,419,751—the commonwealth, so far as that industry is concerned, having then practically reached its centenary.

DIFFICULTIES ENCOUNTERED.

As may be imagined the growth of the pastoral industry to these proportions was not attained without overcoming many and unforeseen difficulties, which, could they have been foreseen, would hardly have been faced. Among these in the first place was the exploration of new country, which had to be undertaken with the usual risks attendant thereon in order to find an outlet for the ever increasing flocks, the pioneers literally going out with their lives in their hands.

WATER SUPPLY.

The greater part of Australia may be classed as a waterless country, the main ranges of mountains being confined to the coastal lines, consequently the existence of

large rivers is a physical impossibility, and one of the first difficulties that had to be overcome in order to make use of the best unwatered territory of the interior, was that of securing a supply of artificial water, for without this only a very small area of the country would be available for stock.

ARTIFICIAL WATER SUPPLY.

This supply is obtained in three ways, viz:—by the sinking of tanks, wells, and artesian bores.

Tanks.—The most common of these methods is that of putting down tanks or excavations. These are generally of rectangular and oblong shape with sloping sides of about one foot in three. The depth varies according to the nature of the soil, but as a rule, if the site be well chosen, a depth of from 10 to 20 feet is obtained—needless to say the deeper the better, as there is a lesser proportion of the surface exposed and consequently smaller loss from evaporation, a serious consideration when the shade reading of the thermometer averages over 100 deg. Fahr. two or three months in the year in Central Australia. The excavations vary in size from 2,000 to 30,000 cubic yards, according to the class of country and number of sheep they have to water. The excavation is chiefly made by means of ploughs and earth scoops, worked by either horses or bullocks, at a cost of from 6d to 9d per cubic yard. The soil taken out of the tanks is sometimes used to form a dam at the back of the tank, i. e., when the levels of the country are favorable, in other cases it is simply heaped up on either side, a sufficient distance away to prevent its being brought back into the tank by heavy rains or stock traffic. These tanks are filled by the drainage from the surrounding country, and the sole reliance for their supply is on the rainfall. They are by no means permanent, and sooner or later, according to the nature of the country in which they are situated, silt up and become boggy. They then have to be scooped out again, and for this purpose special scoops are made, so that the work can be carried on without either men or draft animals having to go into the mud or water.

Wells.—In some parts of the country suitable sites for tanks cannot be obtained, or else the rainfall is so light that it cannot be depended on for a reasonable supply. Wells are then put down in localities which are first tested by boring rods, by which means it is ascertained where there is a reasonable chance of obtaining a fair supply of water. The wells vary in depth from 100 to 300 feet and cost about 20/—($5) per foot. The water is raised to the surface to supply tanks with a capacity of 5,000 to 30,000 gallons, and thence distributed into troughs by automatic taps. Where there is a heavy supply of water and a large number of stock are being watered the raising is done by means of an engine or windmill and pump. In other cases it is raised in buckets by horse or hand power. In many instances the water so obtained is so brackish to be unfit for human consumption, but stock do well on it. The chief difficulty of watering stock for a lengthened period in large numbers (say mobs of 10,000 to 12,000 sheep) at a well or tank is that the constant traffic to and fro destroys all the pasture for miles round the watering places. Stock watered for any length of time at one spot—by the time they have walked in, had a drink, and walked back again to pasture, are ready for another drink. It therefore often happens in dry times, although there may be plenty of water in a well, stock have to be moved to other localities on account of the want of grass in the surrounding country and vice versa; there may be plenty

A WATER BORE AT BANDO STATION, SOUTH QUEENSLAND

of feed, but not near enough to a water supply.

ARTESIAN BORES.

When an artesian supply can be obtained it is by far the most satisfactory method (although the initial cost is great) of watering a large tract of country. In the States of Queensland and New South Wales, where most of the large holdings are situated, it has happily been proved that there is a very large area of artesian country. No estimate can, of course, be formed as to the quantity of water stored in this strata, but it is supposed to be practically inexhaustible, It is estimated that from this source in New South Wales the quantity drawn is 130,000,000 gallons per 24 hours, and in Queensland 384,000,000. There are 60 Government bores and 250 private ones in the former State, and in the latter 582 altogether.

The largest flow of artesian water yet obtained in New South Wales was recently tapped near Coonamble at a depth of 2,371 feet, and the flow therefrom is estimated at 5,000,000 gallons per day, and rises to a height of 8 feet above the casing, which is 6 inches in diameter.

The cost of putting down bores varies according to the depth, but the usual charges are 15/—($3.75) per foot for the first 1,000 feet, 20/—($5.00) up to 2,000 feet and so on. The depths vary from 150 to 3,500 feet, and the flow averages between 750,000 and 1,000,000 gallons per day.

The water comes to the surface very frequently at a temperature of 145 deg. Fahr., and is as a rule highly charged with minerals.

A DUST STORM IN CENTRAL AUSTRALIA.

The discovery and utilization of this artesian supply of water has been the means of making available for stock raising purposes vast areas of most suitable country that without it could have been utilized only on a very precarious footing.

DROUGHTS.

Despite, however, all that man can do to assist nature, droughts will from time to time prevail, and enormous losses of stock occur, as instanced by the results of the last drought already referred to. The water difficulty is as a rule not the greatest cause of loss; it is the want of food caused by insufficient rain-

fall. The country gets dry and parched, and the whole surface is swept away by wind from thousands of acres. Then dust storms prevail in times of drought for months and months, and the whole face of the country is changed. Hills of sand disappear and others rise in different locations. Tanks are silted up completely, fencing and yards and even buildings are covered up, while in some of the inland towns business has to be suspended and lights kept burning all day. A photograph of one of these storms has been obtained, which we give you here, and which will give a better idea of their intensity than anything that can be written.

WILGA DOWNS STATION, N. S. W. OWNED BY GOLDSBROUGH, MORT & CO.

RABBITS.

About 1850 a few rabbits were imported into Victoria from England with the primary object of sport, and today the increase therefrom constitutes practically the greatest drawback to the pastoral industry of Australia. Over the whole continent they are to be met with in greater or less numbers, and they increase and multiply according to prevailing conditions. In good years they are in millions, and in dry years their powers of endurance are wonderful and equal to those of any other animal.

Means of keeping down the pest are continually devised, the most common being the laying of poisoned water and of phosphorized pollard. When the water supply is held in tanks, and the rabbits have to go thereto in hot weather, the tanks are temporarily fenced with wire netting, and the poisoned water is put into troughs placed outside the netting, being protected in such a way that rabbits only can get to it. By these means thousands are poisoned at single tanks in a night.

Phosphorized pollard is administered by means of specially constructed carts, an attachment to which cuts a furrow in the ground, to which another contrivance drops a bait of about the size of the top of one's finger. The scent of the bait and the newly turned earth attracts bunny, who picks up the pollard. The latter method, however, has its drawbacks, such as the risk of sheep being poisoned, and the wholesale destruction of insectivorous birds.

The cost of combating the rabbit pest is a heavy tax in itself, while the damage to the pasture from the rabbits is enormous. In the "back blocks," i. e., the more remote areas inland, edible bushes are the chief standby—particularly in dry years—for feeding sheep, and the rabbit makes wholesale destruction here by eating the bark completely away, thus effectually ringbarking the bushes and killing them. In this manner large areas have been rendered practically of no value.

LEGISLATION.

To the natural troubles affecting the Australian pastoralist are added the evils of bad

legislation. In the past rents out of all proportion to the value of the country have been levied. Ignorance of local conditions is responsible to a great extent for this handicap to the pastoralists, but continued droughts, and general distress occasioned thereby, have caused more attention to be given to conditions affecting pastoral matters, and hopes are entertained of fairer treatment, with secure tenures and lower rents, to encourage people to take up land and improve it, with a view of continuous occupation.

Altogether, in the face of numerous setbacks, the battle of the squatter for existence is, in many cases, an uphill struggle, and goes to prove the stamina of our inland settlers, who have fought and so frequently commanded success in the face of so many disabilities.

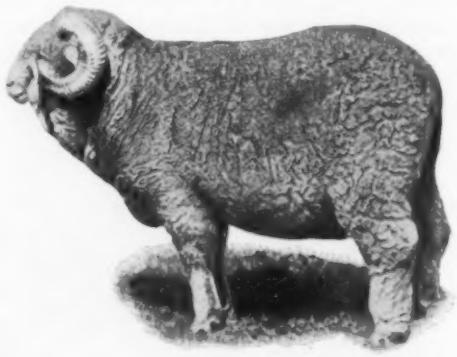
AREAS OF HOLDINGS.

In the coastal areas of southern and south-eastern Australia, enjoying more or less regular seasons, are to be found magnificent estates, with surroundings that make life's journey a pleasant one. Areas of five to fifty thousand acres of freehold land, highly improved, often with magnificent residences, are held by single families, and the returns therefrom, always sure, are to a great extent regulated by the seasons experienced inland. When droughts prevail, and heavy losses are met on the larger areas, the prices of all products are high, to the benefit of those enjoying the regular seasons, while, in general good years, when large consignments of wool and stock come forward from far inland, the incomes of those near the coast suffer an appreciable decline.

The freehold areas are practically confined within 300 miles from the coast, and on the average are larger in size per single holding, as the distance to them is greater, individual estates containing up to 250,000 acres freehold being in the possession of one family. Outside of the distance named, the lands are held mainly on lease from the crown, and range up to nearly a million acres per single holding, but, suffering as these distant places do from intensity of droughts, the rabbit plague, etc., returns on the average are precarious, and possession of them is not eagerly sought.

MANAGEMENT.

The breeding and working of a flock of sheep, and the successful management of a station are just as much a science, and require as much study and thought, as any of the professions. Country being acquired, the settler's object in life becomes the overcoming of natural difficulties, suppression of rabbits,



SIR THOMAS.

securing as far as possible a permanent water supply, erection of necessary working improvements, such as fencing, woolshed, etc., and stocking with sheep to suit the locality. The principal aim of an owner is to improve his flock so as to get each year an increased yield per head of wool shorn. At all well

JUBILEE II.

managed properties the ewes are gone through carefully each winter, and all inferior animals rejected and sold, as fats or otherwise, the selected ones forming the flock that is bred from. This is a most important, in fact, the most important item in the success of a station, as on the skill displayed at

the examination of selections referred to, depends the improvement of the flock in general, and the increased annual output of wool. On most stations is kept a special stud flock, from which the rams are bred for use in the general flocks. These studs are very carefully looked after, and have the best treatment that can be given. The classing of the studs is a most important procedure, each animal being most minutely examined before being judged as worthy of being used as a sire. The successful breeding of sheep is really a gift rather than an art that can be acquired, and but few men, comparatively, attain marked success in the selection of studs that transmit their desirable qualities to the progeny.

SHORTHORN COWS. OWNED BY GOLDSBROUGH, MORT & CO.

An illustration is shown of a ram, "Sir Thomas," sold by Goldsbrough, Mort & Co., Ltd., in 1874 for 680 guineas. At the time that ram was looked on as a type of the best sheep in Australia. Another picture of "Jubilee II." shows the development to the present day. Jubilee is a direct descendant of "Sir Thomas," and is a much more profitable sheep.

The shearing of sheep is done once every year—in the spring—and is done by machinery in many instances, and also by hand shears. The number of stations shearing by machinery is rapidly increasing, it being found that more wool is obtained by this method, besides the advantage of comparative independence of skilled labor; Australia, in common with other parts of the world, having its labor troubles, duly enhanced by the ubiquitous agitator.

In good seasons management is relatively easy, but in times of drought, skill, judgment and intuitive foresight are the qualities required. Economy is the necessary adjunct to good management, and the successful man is he who can tell the exact point up to which it can be exercised without the sacrifice of efficiency.

CATTLE.

In the northern parts of Australia a large area is confined to the breeding of cattle exclusively (the country being unsuitable for sheep) and herds there, principally of the shorthorn type, run into large numbers, as many as 60,000 being kept on individual properties. The estimated total number of cattle in Australia is 7,022,225 head.

Throughout the whole continent, of course, cattle are run, certain areas everywhere being more suitable for them than for sheep, and most sheep stations have their small herds

of cattle. In the north, freezing works are situated at most of the large towns on the coast and considerable quantities of beef are exported to the United Kingdom and elsewhere in the freezing chambers of the numerous line of steamers trading with the country. Down south the numbers are not large enough for the frozen trade to any extent, most of the cattle fattened going into local consumption.

AN ITALIAN COTTON SPINNING MILL.

The Societa Filatura di Mako have recently erected a fine yarn mill in Cordenons, Italy, and the following description has been furnished by S. Schwenzke, Leipzig, the representative of Brooks and Doxey, Manchester, who built most of the machinery for the plant.

The mill is driven by electric motors. The carding, spinning and reeling machinery is operated by the group system, while individual motors are used for the other machines. The two-story fireproof main building is built with 28 and 18-inch walls. The roof rests on round cast-iron pillars, 18 feet high. The distances between posts are 19 1/2 and 22 1/2 feet. The roof is made with a crushed stone foundation, on which wood, cement, an insulating material, and a layer of sand and gravel have been placed. The annex, in spite of its large size, 32 by 38 feet, contains no posts.

Fig. 1 shows one-fourth of the ground plan. Eventually the plant is to be extended so as to include four main buildings to accommodate 100,000 spindles. The buildings will then be arranged so that two large spinning mills will stand opposite each other, each being divided in halves by the corridors, HH. The two buildings shown at Fig. 2 are, consequently, only one half of the plant. The towers for stairways and elevators are of the English type. Separate buildings are erected between the spinning mills, and consist of a storehouse for the raw material and buildings for the preparatory machinery and for the power station, in which an electric current of 8,000 volts will be transformed into one of 250 volts. The power house, C, will also be used for the air moistening apparatus and for the repair shop, D, which includes a smithy and machine and carpenter shops. The office, store and shipping rooms are located in the building, E.

Fig. 2 shows the two stories of one quarter of the main buildings. The first story at the left contains the card room, L, the combing room, M. The former has 16 cards; the combing room 2 Derby doublers and 10 combers. The drawing frames are at N, these are followed by the coarse flyer, 20 intermediate and fine frames at P. In the adjoining room are 16 twisters, Q, 4 spooling

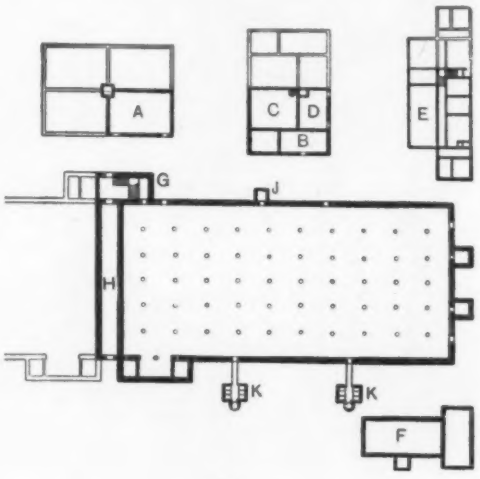


FIG. 1.

machines, R, and 14 ring spinning frames, S. At the end of the room are 10 reels, T. In the second story, shown at the right, are placed 20 mules, U.

Just behind the main building is a yarn singeing house in which a large number of singeing machines are located. The mill contains 25,000 spinning spindles and 6,000 twisting spindles, suitable for yarn from 60s to 180s from Egyptian and Sea Island cotton.

Particular attention is called to the arrangement of the stairs and elevators in the tower, G, also to the elevator, J, in the center of the building. The toilet rooms are in towers, K, which are connected with the main building by closed passage ways through which, however, the air circulates freely. The

rooms are ventilated by means of 100 air shafts in the walls and which begin six feet from the floor. Two electric ventilators supply the room with fresh, moist air.

The drawing and twisting machines are driven by individual motors, the current being supplied by wires imbedded in the floors. This arrangement, however, does not seem to be

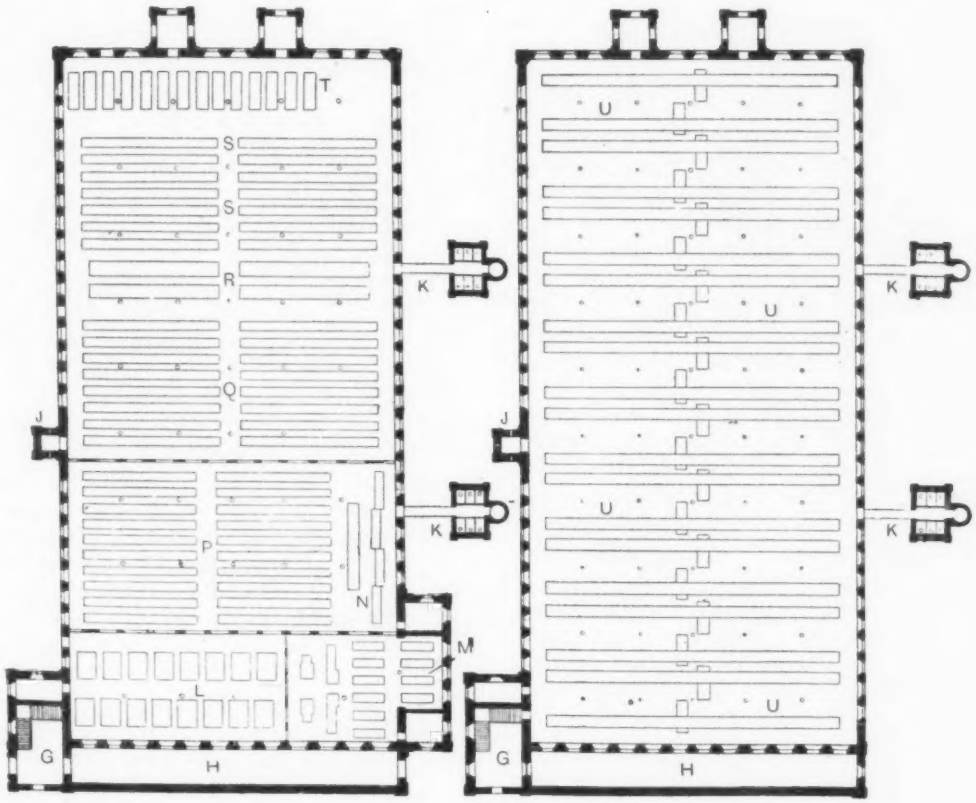


Fig. 114.

FIG. 2.

so good as the usual one, by which the wires are placed in conduits from which the covers can be easily removed in case repairs are necessary. During the first year, however, no occasion has been found to tear up the floors in order to repair the wires. The room is lighted by arc lamps placed on columns, and the light is thrown up by reflectors to the ceiling. It is said that the light is thus well diffused and the room remarkably free from shadows.

The central power station is located about three miles from the mill. The available power amounts to 12,000 to 16,000 horse power, of which only 470 horse power is utilized by two 350-horse power turbines. The turbine shaft is connected with a 3-phase generator from which an 8,000-volt current is obtained. This is reduced to 250 volts at the mill. The turbines, generators and power transmission apparatus are of Italian manufacture. The preparatory and spinning machinery was supplied by Brooks and Doxey of Manchester. Owing to the absence of shafting the work rooms are remarkably free from obstructions which interfere with light

and ventilation. The electric plant is not as liable to derangement as the old mechanical installation, but it should not be forgotten that such an electric plant as is installed in this Italian mill is much more expensive than a mechanical one.—Translated by the Textile World Record from Uhland's Technische Rundschau.

AN INTERESTING COLOR PHENOMENON.

BY DAVID PATERSON, F. R. S. E.

My attention has been called to a series of so-called "magic pictures" issued by a London firm. These pictures, which some of our readers have no doubt seen, present to the eye a mixed up, indistinguishable appearance, the result of printing one picture in green on the top of another totally different picture in red.

The resulting effect very closely resembles a photograph where two different exposures have been made on the one plate—a not uncommon occurrence with the amateur.

Accompanying these "magic pictures" are two small pieces of colored gelatine, one red and the other green.

On viewing one of these composite pictures through the red film there appears a clear definite picture or photograph of a certain place or object; and on viewing it again, but through the green film, another totally different, but equally clear, picture is seen.

On observing for the first time the two totally different scenes from the one "picture," it appears really wonderful.

One of those pictures, for instance, presenting such a jumbled up appearance that one cannot tell exactly what it represents. On viewing it through the red colored film we see at once a picture of the Bank of England, with all its accustomed bustle and life, foot-passengers, cabs, hansoms, etc., as clear as in an ordinary picture, but, of course, diffused with a very strong red light from the film. On viewing the same picture through the green film the scene has changed to Kensington Gardens, with its splashing fountain and sculptured water nymphs, all diffused in a strong green light.

Here again is another picture showing under the red film the elephant at the Zoo, with its load of happy children on its back and its keeper striding alongside; but when viewed with the green film we see the pelican pond, with a number of its queer-looking inhabitants. Each picture is seen as clear and distinct as though it were the only picture printed; all confusion vanishes under the strongly-colored light of the film.

The effect is certainly magical, and depends upon a simple optical property possessed by all colors, viz., "selective absorption." As this property is of interest and importance to all dyers and colorists, the editor has thought that a short explanation of the phenomenon might prove interesting to the readers of the "Dyer."

Red under a Ruby Light.—If we write our name in red ink on a piece of white paper and view it through a red film or under a ruby light, the writing will be invisible. All the sheet of paper is colored red. The same effect is seen when examining any red printed matter in the photographic dark room with the red lamp—no printing is visible if the red be of the proper depth. This is owing to the strongly colored light obliterating all traces of a color similar to itself.

Green under a Green Light.—In the same manner green writing or printing is invisible in a strong green light, or when viewed through a green film. Everything is so suffused with green that a naturally green object or color appears of no color in comparison.

Red under a Green Light.—If the red writing be viewed in the green light it appears black and the same vice versa, i. e., green writing or printing is black under a red light.

This is owing to the fact that red chiefly reflects only red and orange rays to the eye; and cannot reflect any light corresponding with the green, and must therefore remain black. Green light is composed chiefly of green, blue and violet rays and has little or no red in its composition. Blackness, as every reader knows, is due to a total want of reflection of any light, a "total absorption" as the physicist terms it. In the same manner a green color viewed in a red light appears black also; because the green has no color in

common with the red, and not being able to reflect any it must appear black.

Here then is the philosophy of these pictures. The colored films act as light sifters, separating one colored picture from the other. It is a question of color absorption.

On examining with a spectroscope the colored films accompanying these magic pictures, it is found that the red film transmits all the red and scarlet rays as far as the line C, which is in the orange-red, and all the rest of the spectrum is absorbed.

The green film absorbs all the red, orange and yellow rays as far as the yellow green, and then transmits freely the green, and all the blue and violet.

When two colored images are combined, as in these composite pictures, these films act as separators or sifters, showing up in black only the one picture printed in the color complementary to that of the film.

In conclusion it may be interesting to mention that the same explanation applies to the instance of a soldier's red coat looking black in the dusk or in the moonlight. In such a light there is an excess of blue and violet rays. The red, being unable to reflect any blue or violet, remains black.—The Dyer and Calico Printer.

MEMOIRS OF A VETERAN MASTER MECHANIC.

XI.

BY EBEN GOULD

When the war began in 1861, the mills commenced working night and day. This was rather hard on me, and I was often required to stay all night long at the mills, and for many months I put in more time for night work than I did for day work. Oftentimes after working all night, I would go home and try to get a little sleep during the day, but it would be of little use, as no sooner would I get to bed than some one would come with word that Mr. C—— wanted me to come to the dyehouse, or Mr. Twitcher wanted me in No. 2 card room and so on, so I would have to go and it generally ended up in my staying all day, seldom coming home at meal times, as there was always something to do at the noon hour when the mills were stopped. At one time, I did not sit down to a meal with my family for over three weeks. Something needed to be done morning, noon and night, and I had to take my food at odd minutes just as I got a chance.

All this time the mill was at work making soldier's cloth, as it was called.

When the mill first made the soldier's cloth, there was some bother in getting it right in every way. The weight was right, the picks were according to the agreement, but they did not feel firm enough; they were too soft or slazy. Various means were tried to overcome this defect, but nothing was found suitable until the idea of using sweetened water was suggested by the boss gigger.

He first experimented by using a common watering pan filled with a mixture of sugar, molasses and water, which he poured on the cloth while it was being gigged. The first piece he tried was a success. When finished, it had the right feel. After that we rigged over an old machine on purpose to do the sweetening. The inventor of this process was Charley Thompson, the only overseer I found in these mills that was not afraid of Agent Toby Twitcher.

This machine had a cast iron cylinder about 20 inches in diameter, was heated by steam, in front of which was a pair of size rolls, the bottom one projecting into a box containing a liquid made of molasses and water, in which the lower part of the roll ran. The top roll was quite heavy. The cloth was pressed between the rolls and then carried around the steam roll to dry; the bottom roll running in the sweetened water would bring up enough to wet the cloth. Then it was partly squeezed out by the pressure of the top roll. This acted like a sizing to smooth down the long nap on the cloth, which was not sheared very close.

Everything worked all right, but the molasses disappeared very fast, and they soon found that some of the mill help who brought their dinners and midnight lunches had been filling their pails with the molasses and carrying it home. Something had to be done to stop the theft, so when the next barrel came it was set up and tapped, the bung knocked

out and then Mr. Twitcher added a liquid that would not be very desirable for housekeepers to make gingerbread or molasses candy. No more molasses ever went into the dinner pails.

A short time ago, I called on Mr. Thompson, and found him as cheerful as ever, although he showed his many years of age. We talked over old times, and when telling about the sweet sizing of the soldier's cloth, he laughed heartily at the thought of how the flies must have gathered around the soldiers, attracted by the molasses in the cloth of which their uniforms were made.

In the fall and winter of 1861-1862, they built an extension to the No. 3 mill, filling up the space between the mill and the picker house. This addition required more shafting and a larger engine in the picker house, for extension of the three lines of the carding and weaving rooms.

The new engine was a Corliss and was to be set in the same place as the old one, so as to belt on the old pulleys. Now the question came up how we could run the mill with the pickers stopped, as the mill was still running night and day, and how we could get the old engine out and the new one in without having quite a long stop. It was getting near fast day and I said to Mr. Twitcher:

"Can you, by driving the pickers, get enough stock ahead to run the mill from fast day to Monday morning?"

"Yes," he said.

"Well," I said, "if I can have the engine Wednesday night, I will move it outdoors in front of the mill and belt it ready to start the next Monday, then you can take your time in setting up the new engine."

He had not thought of that plan of resetting the old machine, but he was well pleased. He said:—

"Can you do it in that time?"

"Yes, if you will let me do the digging for the balance wheel pit and have that all ready."

"Well, do that, and if you have it ready by Monday, it will be worth one hundred dollars extra."

I went to work, got all the needed tools in good order, bits sharpened and some long, large timber brought in, and by Wednesday night all was ready. Now one might think that it was only a small affair to take out this engine, but with its old fashioned square frame and its two 14 ft. by 2 ft. balance wheels, it was a much heavier machine than the 125 H. P. Corliss engine that was to replace it.

No person about the place thought I could possibly get ready to start in that time. Even Mr. Twitcher could not believe it.

Soon after my talk with Mr. Twitcher, I met the paymaster and he said:

"You are going to move that engine outdoors?"

"Yes," I replied, "but Mr. Twitcher does not think it can be done in that time."

"Well," he said, in rather a rough way, "I'd d—— rather see you do it than to hear you tell of it."

"Mr. Kenwigs," I said, "you have heard me say it, now you come here Monday morning when the bell rings and you will see it done."

I had all my shop help so that I could depend on them and knew they would do all I required of them. We were at it as soon as the works stopped that night, and got the whole thing dismantled, all the pipes disconnected, balance wheels off and all the movables removed. Then I told the men to go home and sleep a few hours. At daylight I had the carpenter at work on the tubes making a frame to set the bed piece on and another man cutting out one of the windows clear to the ground and taking out the brick wall wide enough to slide out the balance wheels. The window was opposite where the pulley and balance would stand and where the belt would run; the timbers were long enough so they could be let into the wall of the mill, resting on the foundation of the mill and then ran back some ways beyond the bed piece, so that after the engine was all in place I loaded one of the wheels on the back ends of the timbers, which made a good hold-down and prevented any movement of the timbers.

I used only one of the balance wheels.

Well, to shorten the story, I did not work the men very late the first night, but on Saturday we worked all night, but not all day Sunday; as it looked like a storm, I had the

carpenters put up a light frame building, boarded and roofed in, with two slide windows; the pipes were extended and connected, belts all on, and steam up and the machine and shafting ran all right with a few hours to spare. The timbers were built into the walls of the mill, and I believe the old engine ran better on these timbers than on the stone foundation. In the morning as the last bell began to ring I started the engine, opened the slide window and soon saw Mr. Twitcher driving towards the mill with Karl Kenwigs.

Mr. Twitcher came directly to the new engine room with that big smile of his. The first thing he said was:

"I did not think you could do it, but now we shall not have to stop any of the works."

(To be continued.)

A NEW GERMAN FULLING MILL.

The latest device for preventing mill wrinkles and streaks comes from Germany and is the invention of two woolen manufactures in Seidenberg. The following description of the machine is taken from Oesterrich's Wollen und Leinen Industrie:

The formation of wrinkles and streaks in the fulling process is a well known and serious difficulty. This trouble is partially remedied in the scouring operation by handling the goods in the open width, but this method cannot be applied in fulling where the pieces must be run in rope form. The streaks are caused by the cloth running too long in the same folds and the time required to produce the streaks varies with the fabric. To avoid the difficulty the pieces are removed from the mill from time to time during the process and opened up so that when they are started again it will be in new folds. This causes loss of time, and in many cases damages the pieces and retards the fulling process by reason of the unavoidable cooling of the goods.

The Seidenberg machine is intended to cause a continual change in the folds without interruption in the process of fulling. As shown at Fig. 1, the rolls are in the form of the frustrum of a cone, the slanting edges being parallel with each other at the point of contact. They are fastened firmly to the shafts so that they can be moved laterally. The surface speed of the roll is greatest at the larger diameter, and this variation of speed causes a constant change in the folds of the cloth as the latter runs between the rolls, as shown at Fig. 2. It is claimed that the resulting friction between the folds of the cloth facilitates the fulling process and makes a thicker and finer felt, the machine handling the cloth with less injury to the fabric and

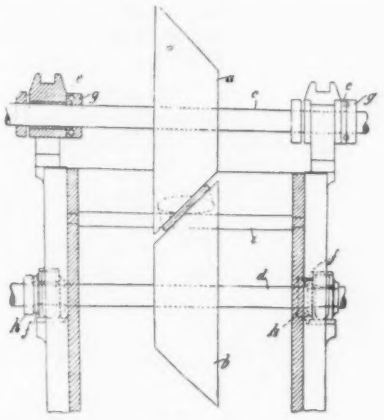


Fig. 1

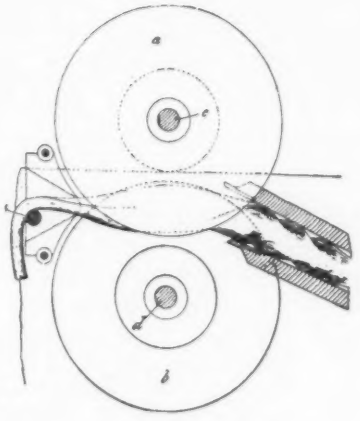


Fig. 2.

less chafing than in the ordinary fulling mill. The new mill is said to have been tested on both fine and coarse goods with excellent results, and that old mills can be changed to the new form without difficulty.

WHY TEXTILE GOODS SHOULD BE ADVERTISED

This is the eleventh of a series of papers upon textile advertising by Thomas Balmer, advertising manager of the three publications of the Butterick Publishing Company—The Delineator, The Designer and the New Idea.

1. Necessity and possibilities of textile advertising.
2. Naming and trade-marking textile goods.
3. Planning the advertising campaign.
4. General publicity and work upon dealers.
5. Actual experience of manufacturers whose advertising has been successful.
6. Brief comment upon six different lines which will then be discussed, one at a time, in the six following papers, based upon actual statistics collected at an expense of thousands of dollars and an equal value for the time demanded for their collection.

XI.

WOOLENS.

The manufacture of woolens and other dress goods of the woolen or mixture class occupies a large number of very important mills. As an industry per se it is one of the most important in the country, but as an industry which advertises to secure business and enlarge the market for its output, it makes a very small presentation in the columns of the magazines.

There is no reason for this, except tradition, prejudice and conservatism.

The only reason the manufacturers of dress goods do not advertise is because they never have advertised. They do not consider themselves as advertisers. They do not look upon their proposition as one that can be advertised, and all this without a grain of argument or reason or sound proof.

In other words, woolen dress goods can be advertised. They are especially susceptible of good advertising, and the reason they are not advertised, except in a small and sporadic way, is because the men at the heads of these industries are not accessible to convincing arguments. They will not listen to the possibilities of advertising. Their one unvarying answer to the good Samaritan who takes the time and trouble to show them their possibilities by pointing to other advertising successes, is, "Well that is something else. My goods are not like that."

Of the textiles that are now being advertised, woolen dress goods occupy the smallest place. Silks and cottons come first simply because the silk and cotton men have been the first to wake up.

Why, for instance, is the advertising of foods considered a natural and legitimate method of increasing business, and not the advertising of textiles? Why may preserves, of coffee, or crackers be advertised, and not cravenettes, Henriettas, serges and cheviots? All are articles of standard and universal consumption. All are bought by exactly the same people. The woman who goes to the grocery store and buys Uneeda Biscuit, buys it because it is advertised. She is the same woman who goes to the dry goods store to pick out a piece of goods for her own dress or for the dresses of the members of her family. This same woman who is reached and appealed to by good advertising in behalf of the food she eats, can be appealed to by good advertising in behalf of the clothing she buys.

The largest volume of advertising in the magazines today, taken as a whole, is the advertising of foods. This is many times larger than that of all textiles taken together. Yet the average expenditure of the average family for food is about forty per cent. of its income, and the average expenditure for clothing is about twenty per cent. Yet the people who make textiles for clothing do not even do half of the amount of advertising that is done by the manufacturers of food products.

The one department of women's dress goods upon which rests the greatest possibilities consists of the woolen goods, black goods, mixed dress goods and others both standards and novelties.

There are thirty-eight million women in this country who must wear clothing of some sort. There are very few of these who do not get during the year at least one woolen dress of some kind. There are a few who get a number of new dresses of this sort of goods a year, and there are also another few who make one dress last a good many years, but one dress a year is a fair average. In addition to this, the great mass of American women have separate skirts, wraps, outing suits, rainproof coats and other things made of this sort of goods—surely a large market.

This market is divided among innumerable manufacturers, with a very fair showing of the foreign mills. The trade is there, but it is divided, and a great deal of it is surrendered, without any attempt to stop it, to foreign manufacturers. These mills have gone on,

year after year, content to make a very good product in comparatively small quantities, to sell over limited territory, without any attempt to interest the larger audience which could be so easily reached.

The only reason any one manufacturer has had any advantage over another has been some question of price or quality. Because none have advertised, the progress of each has been more equal. They have all agreed to shut their eyes to their possibilities, withhold their hands and refrain from getting any larger, any more successful or any richer than just the natural growth from year to year. They have shunned advertising as if it were some unwise, unnatural, dishonorable step, and they have shunned it with unanimity that at least has kept any one from outstripping the rest.

Possibly the most common answer among manufacturers of woolens is that the public is not interested. This because the public has not protested. The public has taken what has been given to it. It has bought goods over the counter year after year because that is the only way to obtain them. It has taken the salesman or saleswoman's word for the quality, without any further backing, has shopped around, experimented, been disappointed, and all without arriving at a definite, safe ground upon which to stand. Yet there is every indication that the public, and especially the woman public, is vitally interested in these fabrics.

Let any manufacturer of woolens step to the dress goods counter of any dry goods or department store and watch women buy dress goods. Does he believe that any information he or anyone can give these women about the dress goods they are buying, would be unwelcome? They are matching samples, cross-examining the clerks, asking questions of their women friends, doing everything possible to make up their minds that the fabrics they are trying to select are all wool, are durable, are well dyed, are fashionable, are adapted to the purpose for which they intend to use them. And who is to help them in this selection? The salesman or salesgirl who may or may not be intelligent, who may or may not be well informed, or who may or may not be well disposed.

Where are the manufacturers of woolens in this country whose dress goods are represented on these shelves where they are often superseded and wrongfully displaced by imported goods through a false impression on the part of the user, who do not raise their hands to see that their goods receive a fair representation and a fair understanding on the part of the woman who wears them and who is after all the court of last appeal? And yet these manufacturers will insist that the women are not interested?

When the English Mills' retail store had its grand opening day in Detroit, it invited, through the newspapers, all its men customers to come and to bring wives or sweethearts to the opening. Flowers were to be given as souvenirs, and the attendance was expected to be large. Such proved to be the case. The attendance was far larger than the proprietors of the store anticipated. Over sixty thousand people attended this opening. The store offered to give away samples of their woolens only to those who were interested enough to ask. Fifty thousand samples were given away, and three samples were given to women where one sample was given to a man, though the samples were entirely of goods for men's wear, this proving that a woman is interested in the selection of goods even for her husband or some other man in whom she is interested. Certainly then she is interested in this sort of goods for her own wear.

With these things firmly fixed in my mind I commenced an investigation of the sale of woolen goods, serges, cheviots, broadcloths, Henriettas and cravenettes as they are bought for suits and other purposes. I have tried to find out the reasons why these different woolens or cloths were selected, the purposes for which they were to be worn, why cheviot was preferred to serge, or to broadcloth or vice versa, relative value of the goods preferred and why preferred.

Another object of this investigation was to find out in what proportion imported goods were preferred to domestic, and especially how much distinct demand there is for Priestley's. Priestley's are almost the only black goods that are popularly known by name, and this has been due to a certain amount of advertising, not only publicly, but on the part of the stores handling them, and

is also due to the long time they have been on the market.

Investigation of Priestley Cravenettes

.. For what purposes are Priestley's cravenettes sold?
2. Is there a decided demand for "Priestley's?" Give reasons for this demand, if there are any.
3. Do you consider Priestley's superior to all others?
4. Have you any criticism to offer on Priestley's?
5. (To our investigator.) Observe if the shop-girl pushes the sale of Priestley's.

Question 1. { For what purpose are Priestley's Cravenettes sold?

Outing wear (hunting, riding, automobiling, etc.	5
Knockabout suits	4
Storm coats or storm suits	3
Spring or fall coats	1
Separate skirts	1
Winter suits	1
General purposes	2
Total	17

Question 2. { Is there a decided demand for Priestley's? Give reasons for this demand, if any.

Note.—Every one of the ten (10) firms interviewed say that there is a *very great* demand for "Priestley's," and that few, if any, persons know of any other manufacturer of cravenette cloth.

Reasons given for the great demand for Priestley's:

Advertising has made the name "Priestley" familiar to every shopper	10
Guaranteed	3
Better adapted to winter suits than the regular covert cloths	1
Soft finish	2
Total	16

Question 3. { Do you consider Priestley's superior to all others?

Think that there are a few domestics just as good	6
Thinks that Friedrich Arnold's is just as good	1
Thinks that Lupin's and Arnold's are just as good	1
Think the domestic dyes are as good as Priestley's	1
Unanswered	1
Total	10

Question 4. { Have you any criticism to offer on Priestley's?

Priestley's cravenettes are too limited in color	7
No criticism	3
Total	10

Question 5. { (To our investigator.) Observe if the shop-girl pushes the sale of Priestley's.

Indifferent to the brand sold	3
Often recommends less well-known brands	1
Unanswered	6
Total	10

I have tried to find out whether the shop-girl believes that this demand is due to advertising or to what.

Ten leading stores were visited in the investigation of woolens, and the following questions asked:

1. What line of woolens do you carry?
2. Discuss the purposes for which the following are worn, and tell why one kind of cloth is superior to another kind for a certain purpose.
   a. Cheviots.
   b. Tailor goods.
   c. Cravenettes.
   d. Broadcloths.
3. What fabrics are being used in gowns this season, and why?

Then follows in direct order tabulated statements of the replies to these questions from the ten stores, showing results in regard to the four kinds of cloth mentioned.

At the end is a tabulated resume showing the kind of cloth most preferred and the reasons why it is preferred, all of which forms a very interesting demonstration to manufacturers of these lines of goods.

I. What line of woolens do you carry?

	Imported and Domestic	Mostly Domestic	Total
General line	2	1	3
Medium line	2	—	2
Fine line	2	—	2
Complete line	3	—	3
Total	9	1	10

II. (a) CHEVIOTS

1. For what purpose are they used?

Street wear	9
General wear	1
Total	10

2. Why is Cheviot preferable to other cloths?

Reasons.	Preferable to Serge	Preferable to Broadcloth	Preferable to English suiting	Preferable to all others	Total No. of reasons
More serviceable	3	1	—	1	5
Does not grow shiny	7	—	—	1	8
Non-spotting	5	1	—	1	7
Non-shrinking	4	2	—	—	6
Lighter	—	1	—	—	1
Better finish	—	—	1	—	1
Total No. of reasons	19	5	1	3	*28

*No. of firms answering this question, 10.

II. (b) TAILOR GOODS

1. For what purpose are they worn?

General wear	7
Traveling suits	2
Rainy-day suits	1
Total	10

2. Why are Tailor Goods preferable to other goods?

Reasons.	Preferable to Serge	Preferable to Cheviot	Preferable to Broadcloth	Preferable to all others	Total No. of Reasons
Dust-shedding	2	3	1	3	9
Not so bulky	—	1	—	—	1
Compact weave	—	—	—	3	3
Non-shrinkable	1	2	1	1	5
Smooth surface	—	1	—	—	1
Light-weight	—	—	—	1	1
Non-spotting	1	1	1	—	3
Total No. of reasons	4	8	3	8	*23

*No. of firms answering this question, 9. One (1) firm did not give any data.

II. (c) CRAVENETTES

1. **For what purpose are they used?**

Outing suits	4
Rainy-day suits	5
Outdoor wear	1
Total	10

2. **Why are Cravenettes preferable to other cloths?**

The general impression is that the chief merit of cravenettes lies in the fact that they are dust-shedding and water-proof and are suitable for spring and fall wear.

Two (2) firms believe that, owing to the limited colors in cravenettes, people are falling back on English suitings.

One (1) firm says that women buy warm cheviot instead of the light cravenettes for winter wear. If cravenettes were available in *winter* goods this would not be the case.

II. (d) BROADCLOTHS

1. **For what purpose are Broadcloths?**

Dress wear	5
Elegant wear	3
Tailor gowns	1
Total	*9

*One firm gave no data on this question.

2. **Why are Broadcloths preferable to other cloths?**

Reasons.	Preferable to Cheviot	Preferable to Serge	Preferable to all others	Total
Compact weave	—	—	2	2
Non-shrinkable	—	—	2	2
Non-spotting	—	—	2	2
Does not wear shiny	—	—	1	1
Fitting quality	1	1	—	2
Total	1	1	7	*9

*One firm gave no data on this question.

Points against Broadcloths { Do not advocate for general wear, because

Catches dust	2
Roughs up	7
Fades	1
Total	10

III. What fabrics are being used in gowns this season, and why?

Kinds of Cloth	No. of times mentioned	Reasons: Clinging	Dust-shedding	Pliable	Drapes well	Style	Non-shrinking	Lightweight	Does not crease	Fast dye	Total No. of reasons
Nun's-veiling	8	2	3	4	2	2	1	1	1	..	16
Silk warp Henrietta	10	3	3	5	2	1	1	1	1	1	18
Cashmere	2	1	..	..	1	..	1	..	1	..	4
Challis	1	1	..	1	..	..	..	..	..	..	2
Eoliennes	4	1	..	1	1	..	1	..	1	..	5
Wool grenadines	1	..	..	1	..	..	..	1	..	..	2
Albatross	1	..	..	..	1	..	..	..	..	..	1
Prunella	1	..	1	..	..	..	..	..	..	..	1
Silk voiles	2	..	1	..	1	..	..	1	..	..	3
Panama cloth	2	..	2	1	..	..	..	..	..	..	3
Total	32	8	10	13	8	3	4	4	4	1	55

Note.—Number of firms giving data on this question, 10.

A second investigation was made more particularly upon the line of black goods. This investigation shows that black goods are growing in popularity and are no longer considered exclusively mourning goods.*

Two things that are conclusively proven by this investigation which are of great interest to manufacturers are these:

One is that cravenettes are losing a great opportunity in not advertising, and the other is that Priestley's cravenettes especially are losing sales because they are not made in colors.

Finally an investigation was started which interviewed twenty-seven leading dressmakers. These are the great New York exclusive dressmakers and also the dressmaking departments of large department stores, doing a high-class business among women of taste and fashion. In this investigation these dressmakers were asked the following questions:

1. What kind of woman's cloths, such as serges, cheviots, broadcloths, etc., do you buy for your trade? Are they imported, or domestic, or both?

2. Do you purchase from importers, or from large retail houses like Wanamaker, or from wholesale houses, or do you import any yourself, or do you manufacture your own fabrics?

3. Do you use cloths of particular makes, in particular patterns, that no one else in your town can get?

4. Do you buy goods on the maker's representation?

5. Do you think it would be a good idea to have the maker's name stamped on the goods? Give reasons for your opinion.

6. Would you be willing to handle goods on which the maker's name was stamped?

7. Are women particular about the cloth of which their dresses are made?

8. What quality or feature, aside from your skill and art in making, do you consider most important in tailor-made clothes?

The answers to these questions have been tabulated.* The following conclusions must fairly be drawn from them; that even the high-grade woman, having her dresses made by a first-class ladies' tailor or dressmaker, is interested most emphatically in the character and quality of the goods the dressmaker recommends her to wear.

This controverts the oft-repeated statement that women who go to first-class la-

dies' tailors and dressmakers do not care what they get; in fact, the dressmaker will not let her have any mind of her own. Second, that many woolen manufacturers of high-grade goods have the idea that high-grade tailors and dressmakers will not use printed woolens.

Now nine express their willingness to handle printed goods; only one commit themselves as unwilling; three would express no opinion and ten state they "might" handle it. Now that is more favorable than to say they "might not" handle it; but to be liberal and to say half would not handle, even after they express this opinion, that would leave a total of five who might be willing to make good their opinion and handle the goods, which added to the nine who had already expressed their opinion that they are willing to handle stamped goods would make the total fourteen—or give seven majority—or half of the whole twenty-three of the establishments interviewed, so that it may be safely said that a majority of the ladies' tailors and dressmakers would not only handle; but some of them give very sound reasons why they would be better pleased to handle printed woolens.

Here is a lesson for the manufacturer from these investigations:

That the future of his product rests in the hands of the salesman, salesgirl or dressmaker; that he himself is not present as a witness for his own goods; that these people may have prejudices, and even if they have not, they cannot possibly cover all the arguments which he himself would like to have presented to the user of his goods.

A moderate expenditure in printers' ink,—a very moderate expenditure when compared with the vastness of the interest represented—would give him just such a hearing.

The women's papers are going every day into millions of homes. Not only are homes the place where such goods are bought, but they are the only places.

The Butterick Trio, for instance, is reaching a million and a half such homes twelve times a year. Through its columns the manufacturer of woolen goods can create a prejudice in favor of his particular brand, can simplify the work of the woman shopper in teaching her to look for the brand when she knows in advance what the brand stands for, can simplify the work of the salesman by enabling him to show at once exactly what his customer wants.

All this means a steady and increasing profit and a steady and increasing trade for the manufacturer. THOMAS BALMER.

*Black goods and dressmakers tables omitted owing to lack of space.

Silk Raising.

The raising of silk cocoons in France is aided by a substantial bounty, but in spite of this the production of cocoons in 1903 amounted to 13,195,591 lbs., as compared with 16,066,109 lbs. in 1902 and with 18,906,072 lbs., the average annual production for the past ten years. A recent report issued by the Silk Dealers' Association of Lyons states:

We are unfortunately compelled to declare again that the French silk production, far from progressing, loses importance every year. We must not, however, draw conclusions too pessimistic from the decrease in the quantity of seeds put to hatch in 1903, a decrease due, in our opinion, to causes entirely temporary or accidental. We must not forget that the frost of the 19th of April, in completely destroying the leaves in many places, caused a profound discouragement among the breeders of silkworms, and that many among them who had not yet put their graines to hatch preferred to throw them away in the fear of being compelled to pay too high a price for leaves. From that fact there was a sensible deficit, which will not occur another time.

Tyre appears to have been the only city in antiquity that made dyeing its chief occupation and the staple of its commerce. The Tyrian purple was one of the most general and principal articles of luxury. The dye for this color was obtained from two kinds of shell fish of which each furnished but one drop.

It is estimated that three-fifths of the cost of a worsted spinning plant is for machinery necessary to processes prior to spinning, that is, to the making of the top.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

A NOVEL METHOD OF EXECUTING DROP PATTERNS

by means of the jacquard machine, with only one-half the design widthways necessary to prepare, the affair resulting in a corresponding saving in labor and time: 1, with reference to designing; 2, card-stamping; 3, lacing of cards; 4, less trouble in running the cards on the loom on account of using cards 1/2 the size only as required in connection with weaving drop patterns in any kind of textile fabrics at present.

Before explaining the new system of mounting a jacquard loom, it will be advisable to give an idea of what "drop pattern" means, for the fact that this system of designing is very extensively used, in fact would be more used than any other system of setting figures, if it was not for the fact that by means of a drop pattern we need a large jacquard machine for its execution, large jacquard cards, etc., etc., all which means extra expense to the manufacturer as compared to all over designs, since the general effect gained by means of drop patterns is more pleasing. By noticing a fabric, for example a table cover, upholstery fabric, etc., it will be seen that the main feature of a straight all over pattern forms the four corners of a square, but supposing the same fabric is ornamented with a drop pattern, then the main feature will form the four corners of a diamond, and when comparing the two fabrics, you cannot fail but be impressed with the fact that the drop pattern has a much more pleasing appearance compared to the straight-over pattern, which looks set and more or less formal. So much for the advantages with reference to general appearance of drop patterns. We now will proceed to describe their construction.

First draw the boundary lines of your design, i. e., your repeat, and divide the space into 4 equal portions, as shown for example in Diagram Fig. 1, and in which a b c d represent the complete repeat of the design. Dividing this square both ways will result in 4 small squares, A, B, A′, B′, respectively. Now go to work and put the same design or portion of design, as we might say, as you have in A in A′, and vice versa the portion you have in B′ in B; A and A′ having for this

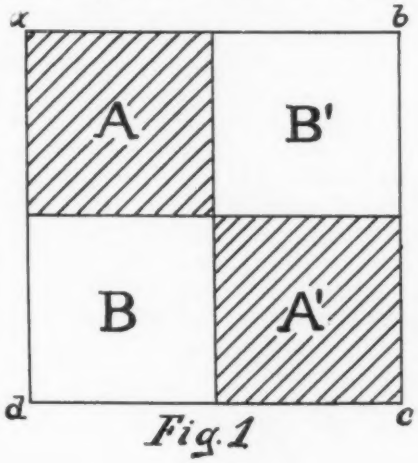


Fig. 1

FIG. 1.

purpose been shown shaded in diagram, in order to convey to the student better the idea we are after, i. e., showing him the placing, or "dropping" of one diamond below another, in the complete design, and which gives the essence of the drop; the term "drop" being the outcome of the custom which has been adopted by wall paper manufacturers or cotton printing establishments of using blocks of a diamond shape, and printing the units of the repeat in juxtaposition, i. e., dropping them, as we might say, considering one effect against the other. It must be, however, strictly remembered that when designing for a drop pattern that the effect in A must be identical to the one of A′, and vice versa B the same as B′, being careful that these two main effects are carefully connected, so as to form a well pleasing effect in the fabric.

The same as we explained in connection

with diagram Fig. 1 squares, the affair also refers to rectangles, and for which reason diagrams Figs. 2 and 3 have been constructed.

With reference to Fig. 2 we will see that we deal with a rectangular drop pattern longer than wide. Rectangles indicated by circles and shaded must correspond with reference to their drop in the design, and in the same manner rectangles indicated by crosses, not shaded. Considering this diagram with reference to Fig. 3, we find that we then deal with a rectangular drop pattern, wider than long, points previously mentioned refer to this position in the same way, both effects having been given, since they are frequently met with; which effect, with reference to rectangular shape, to use, depending on the general character of the design, the size of jacquard machine at our disposal, and at the same time indicates more or less amount of jacquard cards to use. The plain setting is the most frequently used basis for all repeats in a jacquard design, satin settings being less frequently used, for the fact that they increase the requirements with reference to jacquard machine, and jacquard harness mounting considerably, as will be readily understood by the student.

Although we find used satin settings in connection with more expensive silk or linen fabrics, yet it must be remembered that in connection with drop pattern this "plain" setting is the essential elements of the typical drop, and cannot be gotten over, the side points of the diamond drop midway between the top and bottom points, and every true drop pattern if carefully examined will show the diamond as its fundamental plan.

One of the most advantageous uses of the drop pattern, in connection with textiles, certainly is its application to tapestry and Brussels carpets, as sold in the roll, with the standard width of 27 inches, and which by using the drop then will make a carpet on the floor repeat in a width of twice that amount in the roll, viz.: 54 inches. However, if we deal with table covers, upholstery fabrics, silk fabrics, etc., we have not this advantage, for the fact that the repeats of the pattern must occur several times in the width of the fabric on the loom, we then dealing with a totally different texture, and it is for this class of fabrics more in particular, where the new system of loom mounting will come in handy, and its advantages readily grasped by manufacturers, although in connection with art squares, a wide line of carpets, it should not be undervalued.

In order to illustrate this principle of a drop pattern more in detail, the accompanying sketch, Fig. 4, has been given, the same illustrating either a silk fabric or table cover,

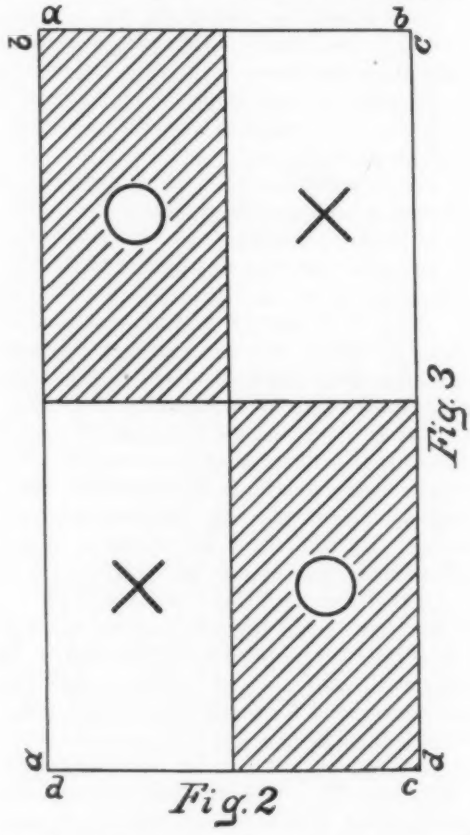


Fig. 3

Fig. 2

or wherever the design may find appropriate use in similar fabrics. Rectangle A B C D indicates the repeat of the pattern with reference to its drop A′ B′ C′ D′, and consequently will explain itself to the student. This perfect drop, as thus explained, is also accepted as the true drop; however, these drops may be varied, say to 1/3 the height, or to 1/4 the height; however, if such an arrangement

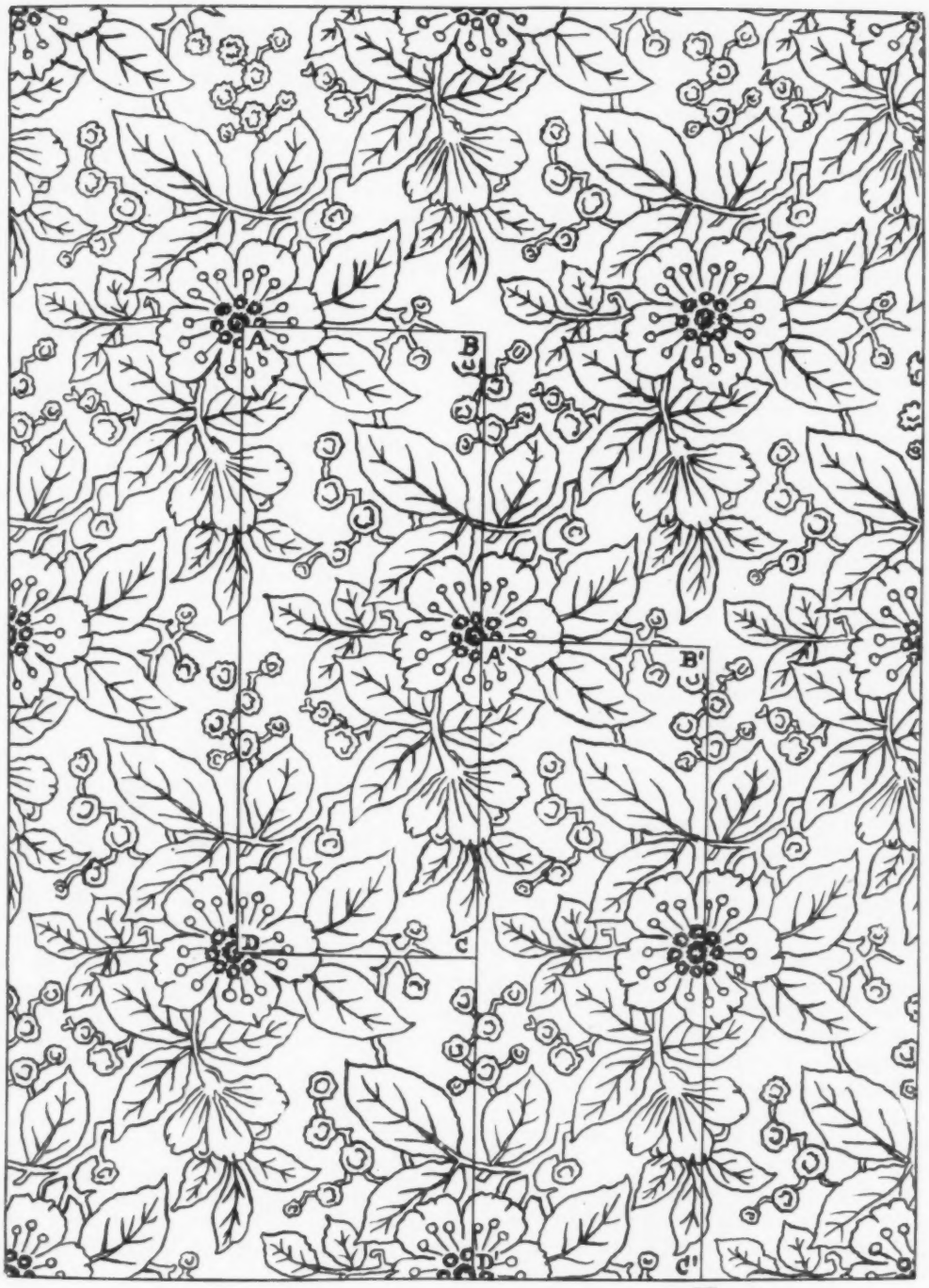


Fig. 4

is used, the effect obtained will, as a rule, not be as pleasing, and in fact they are very little used, we hardly ever meet them, hence will pay no special attention to this kind of drop patterns, which at their best distribution cannot help but have a tendency to show diagonal streaks, the shorter the drop, the worse this streak.

Having thus far given a thorough description of the principles underlying the designing of drop patterns and their importance with reference to all classes of figured textile fabrics, we now will explain their execution in connection with the new jacquard machine, and novel method of tying up the jacquard harness, having for its purpose to be able to produce textiles with drop patterns on a more economical basis.

The jacquard machine may be of any type, either single or double acting lift, with either single or double acting cylinders, cross-bordering, twilling, or the like.

Fig. 5 represents diagrammatically a vertical section of a jacquard machine of the type known as single-acting-lift and with single-acting-cylinders, showing also the new method of building the jacquard harness, in connection with a diagram of a fabric structure in order to be better able to explain the nature of the tie up.

Considering the jacquard machine more in detail, we find the four rows of horizontal needles d′ d^2 d^3 d^4 and p′ p^2 p^3 p^4 shown in each of the two sets, govern the eight rows of vertical hooks a′ a^2 a^3 a^4 and b′ b^2 b^3 b^4 in the usual manner by means of the ordinary loop. Any number of rows of hooks and needles, according to size of design, may be employed, and each set of needles is provided with its own needle plate, back grate, spring box, etc. C indicates the series of lifting-knives as mounted in the griffe-frame, to which is given a vertically reciprocating motion to the extent required for the shed of the harness cords and warp threads.

The card cylinders A and B in the single acting cylinder jacquard are mounted each with its own ordinary fittings, one above the other, but both in one frame, to which is given a swinging or horizontally reciprocating motion. These cylinders may be made each one to turn separately, or one alone may be turned by means of the machine direct, the other being connected to the first by means of bands, chains, or the like, so that they turn together and in the same direction.

The jacquard cards upon the face of the cylinder A act upon the needles d′ d^2 d^3 d^4, and these needles govern, respectively, the hooks a′ a^2 a^3 a^4. The jacquard cards upon the face of the cylinder B act upon the needles p′ p^2 p^3 p^4, which govern the alternate

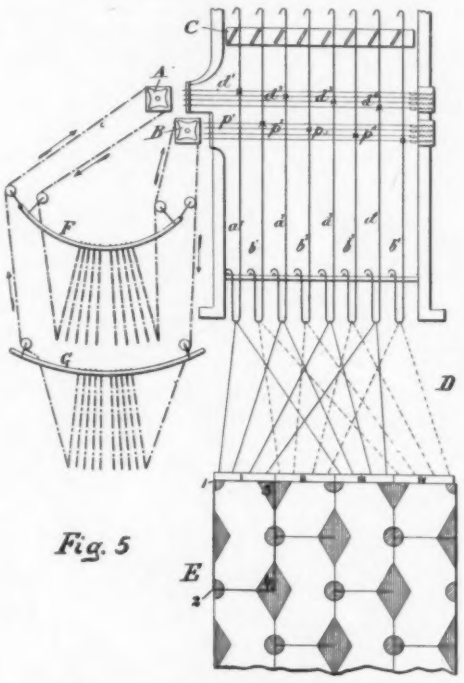


Fig. 5

rows of hooks b′ b^2 b^3 b^4 in the same way. The leashes D of the jacquard harness are shown tied down for a "plain setting" repeat, however explaining at the same time the tie-up of a jacquard harness for any other setting, which in itself only would be more complicated, and consequently little used; plain setting, as previously mentioned, forming the life for drop patterns.

For convenience the jacquard harness D and fabric structure E are shown with one-quarter turn relatively to the jacquard machine and cards, and, as shown, the cards would hang over one side of the loom, but the harness may be so arranged that the

cards hang either over the back or the front. The cords from the hooks a' a^2 a^3 a^4 are tied down to repeats I and III of the harness, while the cords from the alternate rows of hooks b' b^2 b^3 b^4 are tied down to the alternate repeats II and IV of the harness. The result of this arrangement of the machine and jacquard harness is that the design in the repeats I and III is governed by the cards acting on the face of the cylinder A, while the design in the alternate repeats II and IV is governed by the cards acting on the face of the cylinder B. The design is arranged on the drop repeat principle, previously explained in detail, and in which the pattern does not repeat itself straight across the width of the fabric, as in a straight repeat, but has every alternate repeat displaced lengthwise for a certain portion of its length, usually one-half.

Rectangle 1, 2, 3 and 4 shows the whole quantity of design necessary to be painted and transferred to the pattern cards for the pattern shown in E, which is dropped one-half length of the repeat. The full repeat is so arranged that if there be, say, eight hundred cards in its complete length, then taking 1, 2, as the left hand edge and 3, 4, as the right hand edge in cards Nos. 1 to 400 on 1, 2, will join with cards Nos. 401 to 800 on 3, 4, and cards Nos. 401 to 800 on edge 1, 2, will join with card Nos. 1 to 400 on edge 3, 4. The last edge of the repeat 1, 3, joins with the first edge 2, 4, of the next repeat in the ordinary way. This arrangement of the design allows the whole pattern to be completed, as shown in the fabric structure E, if while card No. 1 is governing the weave on any one repeat card No. 401 is governing the weave on the two adjacent repeats upon the right and left hand of the first repeat, and in the same way when card No. 401 is governing the weave on the first mentioned repeat, card No. 1 is governing the weave on the adjacent repeats, and so on in the same way in regular rotation with all the intermediate cards.

Thus to complete the pattern when designed in this manner, the card which is governing the weave in any set of alternate repeats must be always one-half the total number (in this case four hundred) of cards ahead of the card which is governing the weave on the other set of alternate repeats. Thus card No. 1 is governing repeats Nos. 1 and III, while card No. 401 is governing repeats Nos. II and IV; card No. 400 is governing repeats Nos. I and III, while card No. 800 is governing repeats Nos. II and IV; card No. 401 is governing repeats Nos. I and III, while card No. 1 is governing repeats Nos. II and IV; card No. 800 is governing repeats Nos. I and III, while card No. 401 is governing repeats Nos. II and IV.

The pattern cards are punched from the painted design and laced together in any of the ordinary ways.

The card carriers F and G are arranged in two sets, one vertically above the other. The cards are shown placed on the carriers so that each bears one-half of the complete set of cards necessary for the repeat; but they may be divided thereon in any other given definite proportion for which the design has been arranged. When working, one or more cards are turned in either direction for every complete stroke of the cylinder mounting or one card is turned for any other number of strokes of the same as may be required, both the cylinders being turned at the same time. The direction of the cards, when working as described, is indicated in the figure by arrows; but this direction may be reversed at any desired point. The design must be so arranged as to be completed by an even number of pattern cards, and these are placed upon the card carriers and passed round the cylinders of the Jacquard machine, as just described, so that there are exactly one-half of the total number of cards counting from the card on the face of the cylinder A to the card on the face of the cylinder B, and also one-half of the total cards counting from the card on the face of the cylinder B to the card on the face of the cylinder A, counting in the same direction as before along the cards as laced. Thus if there be eight hundred cards in the complete repeat of the pattern, the cards will be arranged as shown in the figure, so that card No. 1 is on the face of the cylinder A, and card No. 401 is on the face of the cylinder B. As the two cylinders are

actuated and revolved simultaneously, the cards will retain the same position relatively to one another and to the cylinders and card carriers during the working of the whole repeat and until such time as they again return into their original position—that is to say, the cards on the cylinder B will always be four hundred numbers in advance of the card on the cylinder A, counting in cyclic order round the entire set, and beginning again at No. 1 immediately after No. 800. Thus when card No. 1 is on cylinder A, card No. 401 will be on cylinder B; when card No. 400 is on cylinder A, card No. 800 will be on cylinder B; when card No. 401 is on cylinder A, card No. 1 will be on cylinder B; when card No. 800 is on cylinder A, card No. 400 will be on cylinder B, and so on.

In a similar manner as thus explained in connection with a jacquard machine, fitted with a single-acting lift and single-acting cylinders, the new method of loom mounting also refers to jacquard machines fitted with double-acting lift and double-acting cylinders, cross border jacquards, or any continuation within reach of a jacquard machine under consideration.

THE FINISHING OF LINEN GOODS.

This branch of textile fabrics, after coming from the loom, is treated variously with reference to their finishing, the latter greatly depending upon the nature of the fabric under consideration and the uses for which it is intended. The home of the linen industry is Belgium, Ireland, Austria, Russia, in fact Europe more or less.

The goods after leaving the weave shed, may be left in its rough brown state, or with that creamy appearance which was imparted to the yarn before weaving; again they may require bleaching, dyeing or printing.

BLEACHING.

In the bleaching processes, the goods are boiled in large iron vessels containing an alkaline lye, and afterwards washed, after which they are taken to the meadows and laid out upon the grass for two or three days. Again they will be boiled and washed, it may be several times, until a certain degree of whiteness is obtained. In this bleaching it is necessary to remove fragments of straw or "sprit" which, through the spinning and weaving processes, have still remained in the yarn composing the texture, and now come prominently in evidence during the bleaching. To remove them, the goods are subjected to a bath containing a chemical solution. A rubbing process which the fabric undergoes, together with a liberal application of soap, is very beneficial in dealing with this sprit of straw; there being also frequently starching and bluing operations connected, but into which it is not necessary to enter.

From the bleaching the cloth undergoes several processes of finishing, one of which is known as "beetling."

BEETLING.

This process is carried on by means of machines known as beetles and which is of Irish origin (although since 1850 this machine is used in Europe extensively in connection with the finishing of cotton goods).

The simplest beetle consists of a strong frame, supporting a large roller upon which the goods to be beetled are rolled, and above which are placed about 30 (or more or less) fallers, i. e., a series of tall perpendicular blocks of wood with square edges. These fallers are each furnished in about their middle with projections, which in turn are operated upon by cams on the main shaft of the machine, said shaft being driven by side-gearing from the motive power of the machine. The cams previously referred to are constructed so as to impart four blows for each turn of the main shaft of the machine. The speed of running the cloth through the machine is such that for each revolution the goods are beetled, or pounded, as we might say, by all the fallers. In machinery later on designed, two beams were used, the beetles working on one, whilst the next lot of cloth is rolled on the other.

In more modern constructed machinery and which work more rapidly, the arrangement thus described has been varied, placing on the lower part of the machine, at each end so as to support the cloth beam, a sort of movable disk with notches. These disks are notched so as to hold three rollers at the

same time, viz: (1) the middle roller on which the beetle acts, (2) the roller on the outside or behind the machine which carries the cloth which has already been under operation and which can be unrolled; and (3) the roller in the front part of the machine, and on which goods are wound during the operation of the machine. The operation of beetling in connection with roller No. 1 being finished, the disks are turned, and when roller No. 1 is brought in position as formerly occupied by roller No. 2, and thus roller No. 2 to that formerly held by roller No. 3, and roller No. 3 taking the position formerly held by roller No. 1, i. e., in the middle position in the machine or the roller carrying the cloth as is under the action of the beetles. This arrangement gives a continuous action to the machine, so that goods can be taken to and from the machine without stopping the latter.

The fallers in the beetle are of very thick, hard, close-grained wood, and are covered with lead, flatten the cloth under operation, i. e., close up the threads composing the texture, giving the latter a certain appearance and peculiar feel and suppleness, characteristic to the fine smooth surface on damask which is so well known. In some of the later builds of machines, on account of production, cams and fallers are dispensed with, eccentrics taking their place. Similar to the machine previously referred to, this machine also uses three beams or rolls, revolving cast-iron disk, and is built with any number of hammers up to thirty. Whereas the machine previously referred to works with 60 strokes per minute, the hammers of the last referred to machine give 450 blows per minute.

Some linens, such as rough hollands and huckabacks, are simply dry beetled to finish them; whereas others, such as bleached huckabacks, diapers, and damasks, are calendered previous to being beetled. Before calendering they are "cropped," i. e., all loose ends and loose fibres on the surface of the fabric are taken off by means of knives arranged in a cropping shear.

CALENDER AND MANGLE.

A calender consists of a series of rollers and cylinders, placed alternately one above the other in the strong framework of the machine. The cylinders are of metal and hollow, but the rollers are solid, being made of compressed paper, very hard and even on their surfaces. The cloth having been wound on a roller at the foot of the machine, is passed on to the first cylinder, and then to the solid roller. From that it goes to another cylinder, and then to the next roller, and so on until it is finally delivered behind. In its progress, it is by weight and lever movements kept firmly pressed between the rollers. One form of this operation is called cold calendering, the cloth being passed through for straightening purposes. It is then taken to a damping machine, where a fine spray of water is thrown upon it by a brush revolving in a trough of water. Then the fabric is taken to the mangle, which in its general appearance and arrangement resembles a calender, but it has much weightier adjuncts. In this machine, between rollers and cylinders, the cloth is worked backwards and forwards, and subjected to a pressure, it may be, of sixty tons. After being mangled, the cloth is taken to a second calender, the cylinders of which are heated by internal gas jets, and then finished so far as the calendering process is concerned.

The fabric is then examined, measured and folded for the market.

PRACTICAL POINTS ON STEAM LUSTERING.

This process has of late come into general use in connection with the wet finishing of kerseys, beavers, broadcloth, thibets, venetians, tricots, plushes and uniform cloth, also for setting worsteds and freeing them from wrinkles. The time that a common water finish would pass inspection has gone by, and nowadays nothing but a thorough steam finish will satisfy the buyer.

The best cloths to take a luster are made of fine, short staple wools, long naps well brushed, so that the fibres all lay flat and straight, giving the highest lusters. For sort naps a five-leaf satin or 4-harness broken twill, warp effect, a five or seven harness corkscrew, are weaves giving the best luster. As a rule, the wetter the gigging, the better the luster.

The old boiling process, as used in years gone by so extensively, in order to produce a highly finished and lustered fabric, although excellent in its ultimate results, fell short of giving production, hence special machinery had to be designed for doing the work equally as well, and at the same time give the large production so much desired by manufacturers; the boiling process only being practiced yet in few mills, and this only where help is cheap. However for the fact, that boiling is yet used in some mills, and that it was the foundation for the modern steam lustering machine, a short description of the process will greatly assist in understanding the object of the latter machine. For this process the goods, after proper gigging and also a thorough wet brushing, on the wet brushing gig, are tightly wound on wooden rolls at the latter machine, a cover being then wound around this roll of cloth and the ends tied. A number of these rolls of cloth thus prepared are then placed by means of the protruding ends of the wooden rolls, in framings in a tank, arranged in such manner that the cloth of one roll will not come in contact with that of another roll nor with the sides of the tank. Two or more tiers or rolls of cloth are thus placed in one tank. After the tank is filled with rolls of cloth, water and steam are turned on, so that by the time the tank is filled, with water, the same will be quite warm. The tank is then covered and the water allowed to boil, and kept at a moderate boil, as regulated by the amount of finish required by the goods, for from four to six hours, care being taken to keep them during the process always under water.

The hot water is then drawn off and replaced with cold water and the goods allowed to cool in this from two to three hours, and then the water is again drawn off and the rolls of cloth taken out and sent again to the wet brushing gig and given another thorough wet gigging, after which they are once more rolled up on the wooden rolls for another boiling, but being this time rolled in the reverse way from before, in order to give even treatment to both ends of the cloth during boiling. It will thus be readily understood that these two boilings as thus referred to go hand in hand, they form one process which in itself complete must be repeated, provided one process should be not sufficient for a certain finish required, giving a thorough wet brushing each time the goods are intended to go to the tank. Goods treated in the manner described will acquire a finish which is lasting, since the heat is slow and gradual, permeating the whole piece evenly, and by reason of slow boiling the finish becomes set in such a way that it cannot be easily destroyed. However, it was and is too slow a process for large production in a mill, a most important item nowadays.

The first machine to take the place of the boiling process was

THE UPRIGHT STEAMER,

which may yet be found in many mills. The object of this process is to force steam through the cloth for a certain length of time, and then cold water, until the goods are well cooled. While the action of the steam upon the wool fibre will bring out the inherent luster of the fibres, one would think that this would be sufficient for the process of steam lustering a fabric, however, it is the action of cold water which tends to set the luster which has been obtained by means of the steam passing through the goods. Besides this, as soon as the steam passes through the goods, a good many impurities, adhering to the structure of the fabric, will thus be loosened and which will be carried off by the water, thus leaving the fabric in a practically cleaner condition than when it went on the machine.

This upright steamer consists of an upright frame with projecting arms at the top and bottom, into the sockets of which a perforated roll upon which the cloth to be steamed has been previously wound, can be set and firmly locked in place. An arrangement of pipes connects the top and bottom end of this perforated roll, with pipes through which either steam or cold water can be introduced, and in turn forced through the cloth, the amount of either, being regulated by suitably located valves.

After winding the fabrics tightly on these perforated rolls, previous to steaming them,

a covering, the same as was used in connection with the boiling process, is wound around every roll of cloth, said covering, however, being this time about two feet wider than the fabrics under operation, and of sufficient length to cover the roll of cloth at least with three thicknesses. After this cover is wound around the roll of cloth, its overlaping ends are fastened down on the roll by a strip of cotton cloth run spirally around the roll, being finally securely fastened, in order to prevent the covering from flopping when the force of the steam comes through the roll of cloth. After this has been done, and the roll placed in the sockets of the projecting arms of the steamer, then steam is turned on and allowed to penetrate the cloth until appearing evenly on the outside of the covering. How long to keep up this process is regulated by the kind of fabric under operation, i. e., finish required, say about five minutes for a fair average time after the steam appears evenly on the covering. After then turning off the steam, the water valves are opened and a powerful stream of water thus forced through the roll of goods until they are thoroughly cold; in some mills a special force pump being used for this purpose. After the goods are thus cooled and the water turned off, the roll is then taken from the steamer, back to the wet brushing gig, unrolled, and given a good wet brushing, after which the process of rolling, steaming and cooling the fabric is repeated, but winding on in this instance the other end of the fabric first, or next to the perforated roll, in order to have the finish uniform throughout the fabric. The number of these steamings with its respective windings on the perforated roll, cooling, unwinding and wet brushing may also be repeated, taking the strength of the fabric and the finish required for it under proper considerations.

However, when we take into consideration this amount of labor required in winding and unwinding the cloth onto and from its perforated rolls respectively, and more particularly in being compelled to cart the goods between the operations, back and forth to the wet brushing gig, it is no wonder, that manufacturers look anxiously for the introduction of a machine to do away with this waste of labor, and it was then that the steam gig made its appearance among wet finishing machinery in woolen mills. The same may be still found in use in a few mills, and practically resembles, or is an up and down gig, the only difference being that its cloth rolls at the top and bottom are hollow, perforated, copper drums, the lower one being set into a trough the same as at the wet brushing gig, both the top and bottom rolls being suitably connected with steam and water pipes. The advantage of the steam gig over the boiling process or the upright steamer consists in the fact that the goods do not leave it until the steaming and wet brushing processes are both completed, a feature which naturally results in a considerable saving in time and labor. Both ends of the fabric under operation at the steam gig, are supplied with a canvas apron, projecting on each side about one foot outside the width of the fabric under steam lustering, and of sufficient length, to permit proper handling of the fabric on the machine. In running the cloth first on the perforated top roll, proper care must be exercised so that the fabric runs on smoothly and evenly and at the same time under as much tension as possible. When on this roll, its apron is fastened to the bottom roll and the goods started to run under a strong tension downward and wind on the bottom roll as is revolving in water, supplied to the tank through the bottom roll and its connections. The cylinders of these gigs are nowadays mostly clothed with stiff wood fibre brushes, and this with good results, in place of using slats containing old, i. e., more or less worn out teasels.

Next the fabric is run again on the top roll, the apron in turn liberated from the bottom roller, run around the roll of cloth and secured to it similar as was explained in connection with the upright steamer. When this is done, open the water valve for the top roll and close the one for the bottom roll. When the water is seen to come evenly through the roll of cloth, turn its supply off and admit steam, the same as explained in connection with the upright steamer, then

cool again with water, run fabric on lower roller, covering it in turn with the other apron, and steam roll of cloth at once. During running the fabric from one cloth roll to the other, the same receives a good wet brushing by the stiff wood fibre brushes the cylinder of the machine is clothed with. A good, strong tension during the winding, and a perfect even winding as well as a thorough cooling by water after steaming, are absolute requirements for the process, otherwise cloudy goods will result.

THE MODERN STEAM LUSTERING MACHINE.

However, the hollow, perforated rolls of the gig, and on which the rolls of cloth were steamed, were soon found to be too small for large production, and since on account of lack of room on the gig they could not be made much larger than seven inches, the demand for increased production soon led to the building of the modern steam lustering machine. It was soon seen that there was quite a chance to increase the capacity of the machine, and while the first machines of this kind were built with seven-inch cylinders, it did not take long before the at present used eighteen-inch cylinders were introduced, and where it formerly took about twenty-two inches of cloth to go around the roll of the steam gig, it now takes about fifty-six and one-half inches to go around one of the cylinders of the modern steam lustering machines, certainly a feature which makes it plain that much more cloth can be steamed at a given time with this machine as compared to the steam gig. Again the cylinders being so much larger, they in turn give more chance for a good head of steam to do its work; and therefore, we must carefully look after these cylinders in this machine to see that they are in proper condition, else steam is sure to be wasted, and in consequence production reduced.

The principle of steam lustering by means of this machine remains the same, and for all practical purposes the work is in a measure identical with that of the steam gig, as previously described, but on account of the improvements made, it is possible to handle more pieces of cloth at a given time than can be done on the steam gig.

With a machine of this kind and large capacity of fabrics it has to handle occasionally, it is reasonable that extra precautions should be taken to insure the best results, and for which reason a few practical points on "how to handle the machine as well as the fabric during the process," will not be amiss. After carefully leveling the machine so that the two hollow, perforated, copper cloth steaming cylinders will run free, and, with the clutches out, can be turned freely by hand, pipe steam and cold water into the tees in the overhead pipes, both front and back, using one inch pipe for steam into the smaller openings and one and one-half inch pipe for water into the larger openings. The valves controlling the steam and water supply should be placed near the tees so they can be handled from the same position as the valves on the machine. The pressure of the steam is not important, as it can be regulated by the inlet valve. It is well, however, to have it fairly even, so that uniform finishing will result, ordinary mill pressures of fifty to seventy-five pounds being about right. Each of the two cylinders is set in a tank, supplied with drain pipes to take care of the surplus water.

The driving belt for the machine should be three and three-quarters inches wide, and of four to six-ply rubber belting, or a mineral tanned leather belting, either of which will withstand the steam and moisture better than common leather belting.

The two cylinders are each seventy-four inches long to the outside of the end collars, and since it is necessary to allow at least four or five inches at each end to tie in the bag, it would not be convenient to steam cloth on the regular machine over sixty-five inches wide or thereabouts; however, special wide machines, for wider fabrics, are also built. The perforated length of the cylinders is fifty-four inches in the regular machine. These perforations should not come inside of four inches from the end of the cloth when it is wound on the cylinders, and two inches is better. When there is a wide variation in the widths of cloth to be steamed in a mill, the perforations should be made right for the widest goods. If they then extend outside of the narrowest goods, the tying in

of the bag at each end will confine the steam to its work. Cloth can be rolled on the cylinders up to thirty-six inches in diameter; more than this will result in imperfect work, since it is not practical to steam through a greater thickness. The cylinders should be wound about once and one-half around with clean, smooth burlap, of which it will take about two and one-half yards, seventy-two inches wide, to each cylinder. Wet it thoroughly in warm water to soften it. Smooth it out carefully when laying it on, rubbing it back by hand. The outside end should be straight, and sewed flat to the layer beneath. Wind tightly with cotton twine, for about six inches close to the end, leaving a tying end exposed, then diagonally three inches between threads to the other end of the cylinder, where another six inches in width is wound closely. Return diagonally across to the first end and tie down to the tying end. This will bind down the burlap so the steam pressure will not bulge out the middle and pull the ends inward. Cover this over with about six layers of cotton sheeting of medium weight. Wet it as before, and start the end at the seam just made. Smooth it with care. Sew it down about two feet from the end, leaving a loose flap. About twenty yards in all of seventy-two inch sheeting will be needed. These burlap and sheeting jackets should be clean by frequent soaping on the outside, and running steam and water through from the inside. They will become dirty, however, even with these precautions, and will have to be taken off occasionally for separate cleansing by running through the washers. Whenever they become stiff to the touch, it shows the pores are full of dirt, and they should be washed.

From three to six pieces may be steamed at once, according to the style and weight of the goods, and the finish required. A few trials will readily show the number of pieces to give the best results on any particular style. The pieces to be steamed together should be sewed one to the other with the nap of each on the same side and pointing in the same direction. A leader should be sewed to each outer end. The sewings should be as flat, smooth, and as even as possible, to prevent marking the goods, a mill sewing machine being the most desirable for this purpose.

The leader or apron should be of good, smooth ticking, twenty-four to thirty-six inches wider than the goods, so that the end of the completed roll on the cylinder can be well wrapped down. In length, said leader should reach once around one of the copper cylinders, and to a good distance beyond the brush, so that when the cloth is started, there will be no part of the fabric remaining unbrushed, about five or six yards to a leader being sufficient.

The cloth is commonly run into the machine from a truck set in front and is first threaded through the "tension bars" and wound onto the "loading drum," with the face toward the operator, and the nap pointing upward. Care should be used to get an even ended roll. The leader is then threaded over the "front break roll," under the "front stretch roll," over the two "brush application rolls," under the "back stretch roll," over the "back break roll," and under the "back cylinder" on the inner side. The leader should be laid around the cylinder with the sheeting flap over its end, the whole being neatly smoothed out. Usually the brush applications are put on to give the most brushing possible.

The back cylinder may now be started. The amount of friction to be applied to the loading drum must be found by experiment. When the friction is once set, however, it can be thrown out and in, giving the same tension every time. A hard and compact roll is wanted, but not so hard that the weave of the fabric will be imprinted on the face of the goods, or the sewings leave their mark. A little time given to the first setting of the frictions will make the machine turn out faultless work. A six-inch heading of cloth, similar to that being steamed, can be laid on the back of each of the sewings as fast as they appear. By the "back of the sewing" is meant the side showing the raw ends of the pieces sewed together. The heading will, therefore, be wound in under or over the sewing according to which side of the seam these raw ends appear. Winding in these headings over the sewings will absolutely prevent their printing on the goods. There

should be no touching or handling of the cloth whatever between the brush and the cylinder, so that it will be entirely free from all marks that might be set in steaming.

When the outer leader has been laid smoothly around the cloth on the cylinder, it should be tightly wound with cotton duck tape about four inches wide, and which is especially manufactured for covering these rolls, and can be bought of any supply house. In winding on this tape, catch the end under the first turn, beginning at one end on the loose part of the leader outside of the cloth. Wrap the end well in, then wind across the cylinder, bringing the sides of the tape evenly together, but not lapping them. If it is lapped, it is liable to print on the cloth beneath, and also to slip sideways when the steam is turned on. Finish the other end the same as the first, drawing up the end of the tape under the last turn. This will form a bag to confine the steam properly. All leakage from this bag not only means loss in coal, but also loss in the time of steaming; it should, therefore, be tight and well made. It is the practice in some mills to wind the tape on an empty winding roll in the winding attachment, keeping a roll for that purpose. In this case a winding attachment on both sides of the machine is required, which in turn enables the operator to make the bag perfectly in a much shorter time.

The cold water should be turned on for wetting while the cylinder is revolving. Open the upper valve of the machine, so the water will run in at both ends and see that the lower valve of the machine is shut, to prevent waste. When the water appears uniformly all over the bag, turn it off. The water should now be blown out of the cylinder. Shut upper valve, open lower valve, and turn the steam on gradually, meanwhile keeping the cylinder revolving to prevent the water settling and clouding the goods. When the water is about blown out of the cylinder, which can be told by the sound after a little experience, shut lower valve and open upper valve.

In timing the steaming, figure from the time the steam appears uniformly on the outside. The duration of the steaming must be determined by actual experiment. It differs according to the pressure of the steam, the quality of the goods, and the finish required. Practice varies in every mill.

Goods that have been steamed will dye about two shades darker than if not steamed. In general, low grade cloths, light weights and dress goods are steamed a comparatively short time, say five to twenty-five minutes. High priced goods and heavy weights should be steamed longer, anywhere from twenty to sixty minutes, and sometimes more than an hour. Any fabric over twenty ounces takes at least a half to three-quarters of an hour for the process. Be careful not to steam low grade goods too long, lest they be made stiff and tender. Too much steaming of any cloth will make it tender, and too little will not give a permanent luster. The longer the steaming, the more the strength and elasticity of the cloth will be reduced. For dull finishes, the steam may generally be turned off as soon as it begins to come through the bag.

After the steam has been shut off, close upper valve, open lower valve, and let in water for cooling very slowly. The cylinder is now full of steam, and if suddenly condensed, the partial vacuum thus formed will bring too great a pressure from the outside air, and a collapse of the cylinder will follow. The opening of the lower valve acts as a safety valve. When a few seconds have been given the steam to condense, shut this valve and open upper valve so the water will be admitted at both ends of the cylinder. The cylinder must be revolving all the time to give quick and even results. The water should be kept turned on until the roll is thoroughly cool all over the outside. This can only be tested by touching with the hand. When uniformly cool, turn off the water, leaving both valves just as they are, open and closed respectively, and ready for the next set of pieces.

The tape should now be unwound, the leader threaded over the break and brush rolls, under the stretch rolls, and under the "front cylinder" on the inner side. The wrapping tape should be wound off on a roll, so it will be left in convenient shape.

The same process of rolling, wetting, steaming and cooling as just explained, are

now repeated, in connection with the front section of the machine.

The cloth should now be wound off directly onto a wood roll set in the "winding attachment" in front, first removing the leader, as it should not be wound in. Start the end of the cloth straight, and see that it lays perfectly flat around the roll. The other leader should also be removed, as a much shorter outside wrapper can take its place. This should be bound well at the ends and middle. Headings, as are cut off from the finished fabrics before rolling them for the market, are good for this purpose.

While steaming on the back cylinder, cloth may be wound onto the loading drum or winding attachment, and, while steaming on the front cylinder, the cloth may be wound onto the back cylinder. During these several winding and steaming operations, there is also ample time to get new pieces, make the sewings, and take away the finished rolls. Thus it will be seen that the machine is designed to be operated in a double and at the same time continuous manner, a feature which cannot help but result in a large production.

After removing the roll from the winding attachment, it is generally stood on end until the next morning. The best length of time to let it stand should be ascertained by a few trials. The longer it stands, the more it will lose in elasticity and strength, especially the former. Pieces steamed in the white that are to be dyed in light shades should be left on the rolls the same length of time. A variation of two or three hours might not be noticeable, but it will be found that the longer the cloth remains on the rolls, the darker the resulting shades. For dark colors, little care is needed in this particular. Piece dyes should be turned end for end, so they will stand about the same time on each end. Wool dyes will not need to be reversed.

Some mills boil the cloth while steaming, by filling the drip pans with boiling water. The steam and water pipes necessary for this purpose can be easily put in by the user with no alteration in the machine. Boiling alone will not give a lustre so high nor as quickly as steaming, besides more or less unevenness is common to the boiling process.

The brush is covered with stiff wood fibre in order to lay the nap well, being for this reason also run at a high rate of surface speed.

For handling worsteds, and where the machine is more particularly used for setting them and freeing them from wrinkles, the brush, together with its application roll mechanism, is not needed.

PRACTICAL POINTS ON WOOLEN CARDING.

ARTICLE I.

In articles on burring, carbonizing, picking, mixing and oiling wool in the April and May issues of the Textile World Record, we have given a thorough description of the preparatory processes of the stock for the card.

The object of carding is to produce a thread in which the fibres composing the same lie roughly and crossed in every direction, and the ends of which are seen to stand out (nap), which is of special advantage in assisting the felting of the cloth, as they will lay hold of each other and unite the different threads of which the fabric is composed into a compact mass.

Three separate carding engines compose what is known as "one set of cards," and which are individually known as: first breaker, second breaker and finisher card.

The wool is fed to the first breaker by means of a Bramwell automatic feeder. The connection between the first and second breaker is generally made by means of a "balling head," by means of which the sliver after leaving the breaker card is wound in balls, and which in turn are set up in a "bank-creel" in rear of the second breaker, and thus fed in the latter. For the connection between the second breaker and the finisher card, the Apperly feeder is a necessary adjunct in up-to-date woolen mills. We will now in turn explain the construction and operation of these three different feeders.

THE BRAMWELL AUTOMATIC FEEDER.

The same consists principally of a hopper in which the wool to be fed is placed by the operator, said hopper having a grating at the bottom for the removal of dirt, etc., dropping

from the stock. An elecating spiked apron is provided at the front end of the hopper to which the material adheres and is thus taken up out of the hopper. Situated near the top of the hopper and sufficiently close to the apron is a reciprocating comb, having a slow but long sweep in front of the apron, the object of said comb being to carry off the surplus wool adhering to the spikes on the apron, and brush it back into the hopper, thus leaving the proper amount of wool evenly distributed over the apron so as to produce an even feed.

The stock remaining on the apron is carried over the top-roller and there meets another but shorter apron running at a higher speed, being also provided with flexible leather strips, which brush the wool off from the teeth of the apron, and convey it into the trough of the machine, which is used as a scale to weigh the stock and deliver the correct amount at intervals to the apron of the feed. The scale or trough is formed of two covered wings, held together by suitable weights, and the mechanism suspended on steel knife edges, being balanced with movable weights, which can be fixed to allow any weight of wool desired to be collected in the scale, before the same is emptied onto the endless feed-apron of the feed.

When the scale has received the required amount of stock, a small trigger is automatically liberated, which action causes a projection to catch on one of the teeth of a revolving disc connected with an automatic clutch, and this in turn disengages the driving mechanism of the spiked apron of the hopper, thus instantly stopping further delivery of a stock to the scale, which now remains at rest, that is, closed.

At the proper time, that is, when the feed apron has traveled sufficiently far to enable the next lot to fall properly on said apron, the wing of the scales is automatically opened apart and the wool is deposited on the feed apron. The scale is now closed again for receiving the stock, and the spiked apron is started, thus delivering stock again to said scales.

THE TORRANCE AUTOMATIC BALLING MACHINE FOR WOOL CARDS.

This machine is a most valuable adjunct to wool carding engines, and is used for the purpose of automatically winding the sliver as delivered from the first breaker card, on spools, producing a smooth and compact ball or spool, and at the proper time discharging the filled spool and replacing it with an empty one, all of which operations are performed automatically by the machine.

These filled spools are afterwards placed in a suitable creel at the back of the next card for the purpose of feeding the slivers to this machine.

The balling machine consists principally in means for rotating the spool by frictional

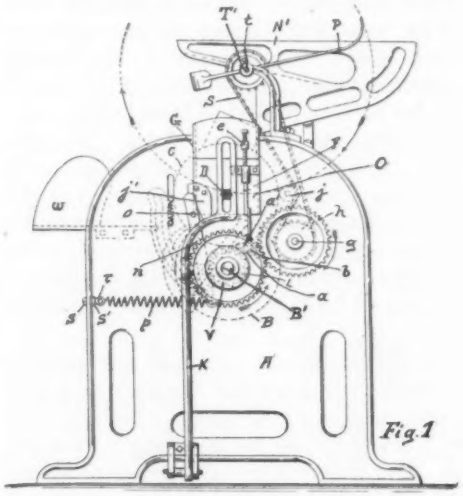


Fig. 1

contact, an arrangement for giving a traversing motion to the sliver as it is being wound on to the spool, a mechanism for inserting, and withdrawing the spindle from the spool, on which said spool revolves while being filled, a device for tearing or severing the slivers from the spool at the completion of said spool, and which at the same time starts the end of the sliver on to a new spool, a mechanism for discnarging the spool after it has been filled, and an arrangement for entering an empty spool to replace the full spool.

The details of the construction and operation of the machine are best given by means of the accompanying illustrations, of which Fig. 1 is a side elevation of the balling machine, Fig. 2 is a front elevation of the machine, Fig. 3 is a detail view of the severing arrangement shown in its normal position and Fig. 4 is a similar detail view of the ar-

rangement, showing the parts in the position during the severing and starting operations on the sliver.

Referring to the illustration, A, A′, indicate the two side plates of the machine. The winding mechanism consists of a drum, B, revolving between the side plates, A, A′, and which is actuated through the main shaft, B′, from the driving pulley B^2. The spool, E, rests on said drum, B, and hence receives its rotation, said spool being placed between two flanges, c, c, in order to keep the sliver in place on the spool while being wound. D,

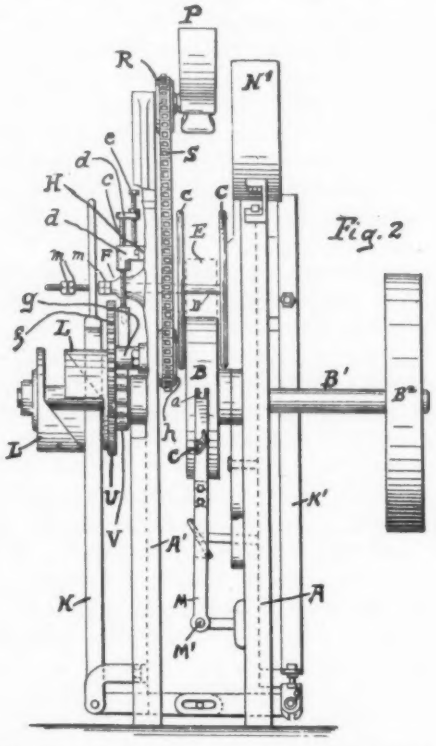


Fig. 2

indicates the spindle on which the spool, E, revolves, said spindle passing through a circular hole in the verticle slide, F, and through a slot in the lever, K, and hence said slide, F, is carried upwardly in the slide groove, o, on the frame plate, A′, as the spool becomes larger in diameter due to winding on the sliver.

The traversing arrangement for guiding the sliver on to the spool to produce a smooth winding consists principally of a reciprocating spreader, M, pivoted at, M′, and having a tension guide, C, near the top and a slot "a" at the top, through which the sliver passes to the spool. The object in having a slot, instead of an eye, is that the sliver can be readily threaded.

When an eye was used, the operation of threading frequently occupied considerable time, in which the sliver, issuing from the first carding engine formed a slack therein. When this slack was considerable, it rendered it necessary to break the sliver to form a new end and a new attempt at threading the eye and inserting the end in the balling machine. The broken-off end involved a loss. In the present case, as mentioned, the sliver can be inserted without delay. The purpose of the tension, c, is that any slack may be taken up and the said sliver be given the proper tension in entering between the drum and spool as it is fed to the balling-machine, thus insuring more even and regular supply of sliver to the spool and insuring a more perfectly uniform product.

The tensioning device consists of a forked piece pivoted upon the outer face of the spreader, M, as shown in Fig. 2, and provided with means for clamping upon the said spreader when the proper adjustment is obtained.

The arrangement for the insertion and withdrawal of the spindle, D, from the spool, E, consists of a lever, K, which is actuated by a cam, L, at the proper time.

The spindle, D, is adjustable in its relation to the lever, K, so that its movements longitudinally back and forth, in connection with the head, for forcing the empty spool into position may be varied to compensate for wear, etc. To secure such adjustability, said spindle is threaded where it receives the lever, K, as shown in Fig. 2, and on opposite sides of said lever are arranged on said threaded spindle limiting-nuts, m, m, in pairs, one nut locking the other.

When the spool has received the desired quantity of sliver and is ready for removal from the machine, the cam, L, operates the lever, K, to withdraw the spindle from the centre of the spool. This action allows the heavy parts which have been raised to drop,

and the ball or spool of wool is free to be pushed forward. To avoid any concussion by the parts dropping, there has been arranged on each of the side plates a lever, n, (see Figs. 1 and 2), which is fulcrumed at o, to the said plate and lies in an approximately vertical position, held there by a spring, p. On each of the sliding bearings, G, is fixed an inclined bracket, j', which lies in the path of the abutting end of the lever. As the movable bearing gravitates, the inclined bracket, j', engages the end of the lever, retarding the downward movement of the same, so that it comes to its lower position noiselessly and with ease, as will be understood. The spring, p, can be adjusted to increase or diminish the tension by means of a screw-bolt, r, and nuts, s, s'.

The severing and starting arrangement for the sliver consists of a breaker, V, which

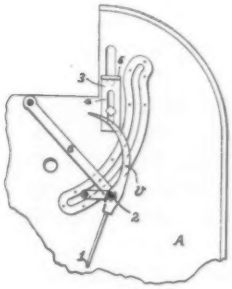


Fig. 3

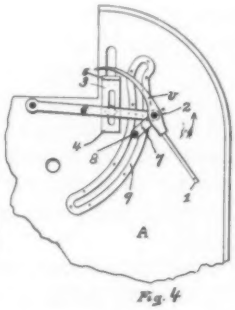


Fig. 4

is attached to one end of a lever, 6, which is actuated at the proper time by a suitable cam, causing it to assume the position shown in Fig. 4, said breaker being given the proper movement as it assumes the said position, by being connected to a short arm, 7, which carries a pin, 8, sliding in the groove of the guide, 9.

In connection with the ordinary breaker for separating the sliver after one spool is full and preparatory to winding a second, a "kicker" is provided for throwing the full ball from the "chute," w, where it lodges after having been pushed forward by the discharging arrangement, and while the breaker performs the operation of severing the sliver, and thus detaching the said full ball. In this case the kicker, l, is attached to the breaker, v, near the fulcrum, 2, so that when the breaker rises, as indicated in Fig. 4, under the impulse derived from the cam, previously mentioned, to engage the sliver and break the same and wrap the loose end around the second spool, the projecting kicker engages the full ball and throws it from between the holding arms of the chute into the receiving-box, as will be understood.

To give the breaker, v, a more positive, quick, and certain return impulse after it has performed its functions of breaking the sliver and wrapping the same onto the second spool, a spring actuated return presser 3 is provided which is arranged on one of the side plates A, as shown in Figs. 3 and 4. The said return-presser consists of a sliding plate 4, provided with a projection 5, which engages the ordinary breaker-lever 6 at or near the end of the upward movement of the latter, which upward movement is continued to its close against the stress of a spring (not shown), attached to said return-presser and to the bed-plate A.

After the breaking has been accomplished and the mechanisms which have served in raising the breaker are free of the actuating means, the spring is free to bear the lever 6 and breaker v, connected with it, downward until the latter parts are free to continue their downward movement under the influence of gravity.

After the spool is filled and the spindle withdrawn, the full spool is discharged from the machine. Upon the side plate A' is secured the bracket N', which is provided with the perforation T', into which is secured the bearing-pin t to keep in place the revolving bat P, which discharges the ball of sliver. The sprocket wheel R and the revolving bat P are secured together and revolve upon the pin t by the linked chain belt S.

Upon the inner end of the cam L the gear U is placed, this gear being permanently secured to the said cam L. To the shaft B' the ratchet V is secured. The shaft B' revolves in the hubs of the cam L and gear U which are secured together, the ratchet wheel V, as mentioned, being secured firmly to the outer end of the shaft B'. Near the periphery and upon one side of the gear-wheel U the pawl a, with the stud b, on which the pawl a vibrates, is secured.

c is a vertical retaining lever, secured in the lugs d upon the bearing H. This lever c is adjustable with the screw-nut e to regulate the size or diameter of the ball of sliver to be made.

f is a gear secured on the shaft g. The gear wheels f and U are of the same diameter and contain the same number of teeth.

h is a sprocket wheel of the same diameter as sprocket wheel R and contains the same number of pins and is secured upon the shaft g.

j is a pulley to support and take up the slack of the chain S and to prevent the chain belt from interfering with other parts of the apparatus.

The operation of the mechanism is as follows: As the spool increases in size the sliding bearing H, with its duplicate sliding bearing, which is not shown in the drawings, gradually rises in the slots O by the pressure of the increasing spool of sliver until the lower end of the vertical retaining-lever c releases the shank a′ of the pawl a, arranged on the side plate A, thereby permitting a spiral spring to cause the pawl to engage the ratchet-wheel V, which is firmly secured to the shaft C, thereby causing the gear-wheel U, engaging the gear wheel f and the sprocket wheel h, through the medium of the shaft g, to revolve, thereby causing the sprocket wheel R and the bat P to also revolve through the medium of the chain belt S. When the pawl a engages the ratchet wheel V, thereby communicating motion, as just above described, the lever K, operated by the cam L, withdraws the spindle D from the spool E and immediately thereafter the revoving bat P discharges the spool of sliver into the chute. The bearing H, with its duplicate bearing, falls to its original position, carrying with it, as a matter of course, the vertical retaining lever c to its original position, and which then engages the shank a′ of the pawl a, thereby disengaging the pawl a from the ratchet wheel V, when the revolution of the parts just above described is complete, and the revolving bat and the connecting devices from the main shaft B′ rest until a subsequent spool of sliver is completed, when the operation is again repeated.

The subsequent spool from the spool holder N is introduced into position between the disks E by the action of the lever K′. To prevent the spools from getting vertically two abreast in the spool holder, owing to the carelessness of the attendant or otherwise, and then when the pocket has dropped to its lowest position the two rolling out together, one into the pocket and the other onto the floor, a guard 12 is provided within the frame near the point of exit from the same and above the track.

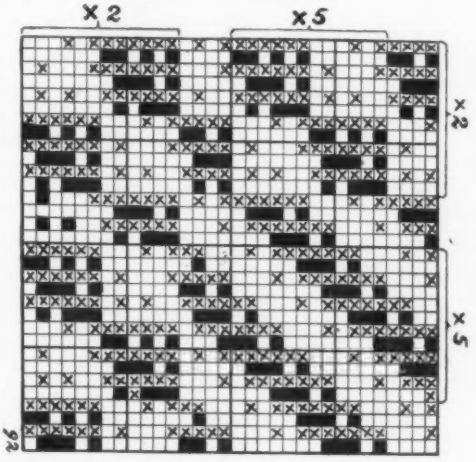
The spindle D, as previously explained, is thrust into the centre of the spool by the lever K.

(To be continued.)

NOVELTIES FROM FOREIGN SOURCES.

Worsted Suiting.

Complete Weave. Repeat 92 × 92.
Warp:—8,580 ends, 24 harness, fancy draw.
Reed:—22 × 6 = 65 inches wide in loom.



Dress:—

26 ends, 2/56's worsted, black.
1 end, 2/56's worsted, black and 300/2's pearl, silk twist.
1 end, 2/56's worsted, black and gray, twist.
12 ends, 2/56's worsted, dark gray mix, twist.
1 end, 2/56's worsted, black and 300/2's pearl, silk twist.
1 end, 2/56's worsted, black and gray, twist.
32 ends, 2/56's worsted, black.
1 end, 2/56's worsted, black and 300/2's pearl, silk twist.
1 end, 2/56's worsted, black and gray, twist.
12 ends, 2/56's worsted, dark gray mix, twist.
1 end, 2/56's worsted, black and 300/2's pearl, silk twist.
1 end, 2/56's worsted, black and gray, twist.
2 ends, 2/56's worsted, black.

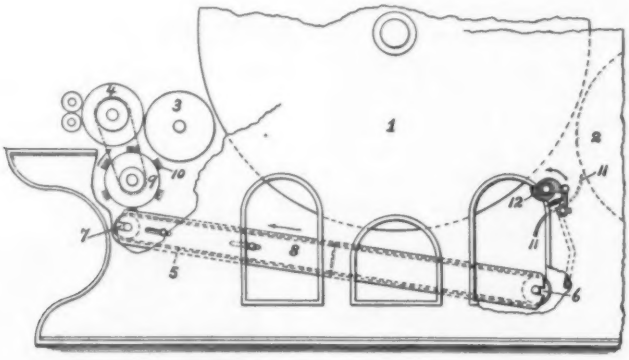
92 ends, in repeat of pattern.

Filling:—126 picks per inch, same arrangement as to colors and counts of yarn, as used for warp.
Finish:—Worsted finish, 56 inches wide.

CHOQUETTE'S WASTE SAVER FOR CARDS.

This device is used in connection with woolen cards, its object being to recover the good fibres from the waste as falling from the cylinder of the card, and returns said recovered fibres to the feeding mechanism of the card.

The device consists principally of an endless apron, equal in width to the width of the cylinder, and passing around a guide roller at the front end and near the bottom of the machine, and another guide roll near the back of the machine, but which is sufficiently high as to make the apron travel at an angle toward the back of the machine. A brush cylinder is provided at the rear end of the machine at the point which the apron starts to pass around the guide roll. A shield is provided at the other end of the apron to prevent any waste from collecting on any braces, projections, etc., under the working part of the machine.



The details of the construction and operation of the device, as well as its application to the card, are shown in the accompanying illustration, which is a diagram giving a partial side elevation of the card and the waste saving device attached.

Referring to the illustration, 1 indicates the card cylinder, 2 is the doffer, 3 is the tumbler, and 4 the bur cylinder; 5 indicates the endless apron passing around a guide roll, 6, at the front of the card and passing around another guide roll, 7, near the rear of said card. On each side of the apron is placed a board, 8, extending slightly above the level of the apron to prevent any of the waste from dropping off at the sides. Situated above the rear guide roll, 7, is a wire brush cylinder, 9, revolving in the direction of the arrow, being made up of parallel strips of straight wire teeth, 10, similar to the teeth on a "fancy," said cylinder being just sufficiently high above the apron as to have its teeth just miss touching the apron, but which enables it to catch any fibres lying on said apron without taking up the dirt which is also on said apron, and the relation of the speeds of the wire brush cylinder and apron is such that the dirt on the apron will be discarded. It will be seen that this wire brush cylinder is really the main point to attend to, to get good results and the arrangement of the teeth, 10, on the brush cylinder is an important item.

In these cards, there are often braces or other stationary parts under the working part of the machine, and on which waste is apt to collect, and to prevent this, a vibrating shield, 11, is provided. This, as shown, is vibrated by a cam, 12, and thus throws any waste collecting on it, down onto the traveling apron.

In the practical operation of the device, the apron is given a traveling motion in the direction of the arrow and as the card continues to work, the waste and dirt will drop down on said apron and pass toward the revolving wire brush cylinder. The action of this brush will take the fibres up off of the apron and deliver them to the tumbler, 3, to be again fed by it to the cylinder of the card, without taking the dirt, etc., along with it, the latter, as mentioned, being discarded from

the apron by the combined action of the brush and said apron.

It is built by the Torrance Mfg. Co., Harrison, N. J.

COTTON.

The cotton fibre is the filament which grows around the seeds of the various species of the cotton plant.

The fruits of the cotton plant known as "bolls" (of about 1 inch diameter) are divided by membranous walls into three or five cells containing three or four seeds each, and from which the thin, transparent, cylindrical filaments known as cotton grow, said filaments being pressed against each other in a more or less matted condition. Towards maturity of the boll, these filaments are changed from their cylindrical form to a compressed or ribbon shape, by means of the collapse of their walls; each fibre simultaneously twisting more or less on its axis, causing in turn a sufficient pressure on the inside of the boll to burst the latter at the junctions of the compartments in the casing, which by this time has become dried up. After being left on the plant for a few days, so as to properly ripen the fibres, the cotton is picked. During the time the cotton thus remains on the plant, exposed to the direct influence of the air (if the weather is unfavorable), great damage to the fibre may be done either by rain which stains the cotton, excessive heat, which renders the fibres harsh and brittle, or of storms, which fill the exposed cotton with leaves, dust and sand.

THE LENGTH

of the cotton fibre varies from about 3/4 inch to 2 1/2 inches, and upon this length, commercially known as "staple," the value of a respective lot of cotton depends.

THE COLOR

of the cotton fibre is not always what we practically term white, but is sometimes creamy, as in Sea Island, or of a light and varying golden tint, as in brown Egyptian.

A MICROSCOPAL EXAMINATION

of cross sections of the various cotton fibres will reveal considerable individuality amongst them, some exhibiting thick cell walls with a very small central cavity, while in others the hollow tubular space is greatly enlarged. Some fibres also retain much of their original cylindrical form, while others are completely flattened exhibiting only a mere line instead of a central cavity, the latter change in structure indicating what is known as unripe or dead fibres, by which is understood that such fibres have not attained full maturity. Their detection is very important, since their presence is very detrimental to yarn and fabric. They are recognizable by the very thin transparent filaments, which, though ribbon shaped, are not twisted, and do not exhibit the slightest trace of lumen in the cell.

Half ripe fibres are a medium between ripe and dead fibres, and in conjunction with the latter, according to amount present in a lot of cotton, depreciate its value to the manufacturer, such fibres being the result of the cotton being removed from the pod before fully matured, a feature readily explained by the fact that the stages of maturity vary considerably even on different parts of the same seed, since the germination of cells does not begin simultaneously at every point on the surface of the seed, and the absorption of the parts of the cell walls in contact throughout each linear deposit is not effected at the same moment, and that the secretive and suctorial powers of each individual tube are not all of the same force and energy.

The proportion of half ripe and unripe fibre is also more or less dependent on the character of the season and the health of the plant. Again, fibres produced on the crown of the seed are always more advanced compared to those on the base; and it is by the removal of this undergrowth, in the process of ginning, that so much immature fibre exists in the general cotton supply.

Ripe cotton fibres are hollow nearly throughout their entire length, with the exception of the end which had not been attached to the seed. This hollowness of the ripe fibre allows the dyestuffs to penetrate, and produce evenly dyed yarns or fabrics, whereas unripe or dead cotton, which practically has no central cavity, is very difficult to dye, and frequently appears as white specks on dyed pieces, particularly in such as are dyed indigo blue or turkey red.

THE DIAMETER

of the cotton fibre, which varies from 0.0004 inch in the best of Sea Island to 0.001 inch in the lowest of Indian, is, in the average, somewhat less than that of wool, the latter ranging from 0.0005 to 0.002 inch; but a comparison of the thickness is of absolutely no value in distinguishing between the fibres. In this respect silk also is similar, having a diameter of about 0.0007 inch. Comparing silk, wool and cotton fibres of equal diameter, silk is much the strongest fibre, wool the weakest, while cotton holds an intermediate place. In respect to elasticity, however—apart from that due to the spiral character of the fibre—both wool and silk are much superior to cotton.

THE SPINNING PROPERTY

of cotton fibres largely depends upon their spiral character, which feature greatly facilitates the interlocking of the fibres and largely increases their grip upon one another. This spiral character of the fibre—its natural twist—is due to unequal or irregular drying of the cell walls. The direction and the amount of twist varies, increasing as the plant is cultivated. No turning of the axis takes place in the formation of this twist, the same being the result of the action of natural laws acting externally, and is not an inherent feature or essential part of the life of the plant. Owing to this presence of natural twist, cotton can be distinguished from other fibres and can readily be detected by means of the microscope in yarn or cloth, whether in a rough, dressed, dyed or undyed condition. Wild silks, however, have frequently a very similar flattened and twisted fibre, and may frequently be mistaken for cotton if the microscopic appearance alone is relied upon, but the two fibres can be distinguished by chemical tests. Mercerized cotton presents an entirely different appearance to ordinary cotton, due to the chemicals used in this process.

IMPURITIES AND MOISTURE.

There are always several kinds of foreign impurities met with in raw cottons and which include sand, broken seed, leaf, notes, etc. Sand, when present in the cotton, is termed "Dead Loss," whereas an excessive amount of moisture present in a lot of cotton is termed "Invisible Loss."

The amount of moisture contained in cotton varies from 6 3/4 to 12 1/2 per cent. over absolute dryness, anything over 10 1/2 being considered excessive and for which claims can be made. Raw cotton, after being exposed for several days during its process of manufacture, to the working temperature of a mill, which ranges on an average from 70 to 90 deg. F., will, if placed for twenty-four hours on the ground floor of the mill, open to the outer air, absorb from 1.6 to 3.6 per cent. of moisture, the amount varying with the state of the weather and climatical conditions, a feature which will indicate that cotton will lose about 5 per cent. of moisture in the course of its manufacture, and afterwards regain from 2 to 4 per cent. of said moisture by proper conditioning of the yarn.

Acids have a very destructive effect on cotton fibres so that their use in the cotton industry is generally dispensed with, since alkalies, such as soap, borax, ammonia and phosphate of soda, can be employed for scouring and cleaning cotton fibres without materially injuring them. In boiling cotton with caustic alkalies the air ought to be excluded and the goods kept well under the surface of the liquid, otherwise defects will be caused in the subsequent bleaching of the goods.

MERCERIZED COTTON.

Cotton in the form of a yarn or fabric, when immersed in a solution of caustic soda of a density of 45 to 50 deg. Twaddell, undergoes an important change. The cell-wall of the fibres will swell out, and acquire a glossiness that causes the yarn or fabric to have a silky appearance, the process being known as mercerization. The swelling of the fibres during this process causes a shrinkage in their length, the fibres become more transparent, and gain something in strength and in weight, their capability for taking up certain dyes being greatly increased.

(To be continued.)

In 1888 the first wool conditioning house in Great Britain was authorized at Bradford, as a municipal institution, under the authority of an act of Parliament.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

CHANGING THE WEIGHT OF FABRICS.

BY ALWIN SCHMID.

How often has the reader been called upon by a customer to duplicate in appearance a certain class of goods, but in a different weight? And how often did he make up special warps, change the reeds and picks, and make costly trials, when by a simple but not well understood method he might have hit upon the right thing at the first time? The writer has been in mills where, from the superintendent down, nobody knew anything of such a calculation, and trials of a rather costly character had to be made, even going so far as changing the spinning frames off and on to special yarns.

Sometimes a man is found who works such a problem by a rule set down in a textile book. This is all right so far as it goes, but it is usually found that without the book the man is helpless. It has been my good fortune to read some of the instruction papers of textile schools and various books in which this subject is treated, and in each case reference was made to a square root which had to be fully understood to be able to make the calculation. I made some experiments along this line to find a better method.

The drawings in the article are very much enlarged, but the relation of the different yarns to one another are the same in actual results. The sections are represented by squares for better explanation.

If a cloth is made of No. 1 yarn with 4 threads to the inch and with filling so fine that it will not come into the calculation at all, the fabric would appear as shown at Fig. 1.

Suppose also that this cloth weighs 1 ounce to the yard and the weight is to be reduced to 1/2 ounce while still retaining the general appearance of the original. The width is to be the same.

It is plain that only one thing can be done and that is to reduce the height of the square, or in other words, the thickness of the cloth by one-half. Then the square will look like the outline of Fig. 2, that is, it will be just as wide, but only half as high as at Fig. 1.

The yarn being round, its diameter is the same in all directions, therefore, the little squares indicating the yarn in Fig. 2 are as wide as they are high. It will be seen that eight of these little squares are contained in Fig. 2, showing that twice the number of threads are needed to make the goods of the same density, if the weight is reduced one-half.

The next thing to determine is what number of yarn is to be used. By comparing the small squares indicating the warp threads in Fig. 2, it wil be seen that they are only one-fourth the area of those in Fig. 1, which means that they contain only one-fourth the material, wool, cotton, etc. This being the case they are four times lighter, or No. 4 yarn.

The foregoing being fully understood we may set down the following rule:

To imitate a certain cloth in another weight divide the weight of the original goods by the weight of the good wanted, and multiply the number of threads or picks per inch in the original goods by the quotient. The result will be the number of threads required in the new sample.

For example:

1 oz. $\div$ 1/2 oz. $= 2$.

4 threads $\times$ 2 $= 8$ threads.

To find the yarn number, square the quotient already found and multiply the product by the known yarn number:

$2 \times 2 = 4$.

$1 \times 4 = 4$.

Ex. Let us assume we have a 36-inch 6-yard print cloth, with the square construction 72 threads and 72 picks per inch of 42s yarn. A 4-yard cloth is required. 6-yard cloth is equivalent to 2 2/3 ozs. 4-yard cloth weighs 4 ozs.

$2\ 2/3 \div 4 = 2/3$.

$72 \times 2/3 = 48$, number of picks and warp threads in the new cloth.

$2/3 \times 2/3 = 4/9$.

$42 \times 4/9 = 18\ 2/3$, yarn number for new cloth.

Ex. A 4-yard cloth with 15s yarn in warp and filling and 40 picks square construction is to be duplicated in 5-yard goods.

4-yard goods weigh 4 ounces. 5-yard goods weigh 3 1/5 ounces.

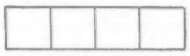


Fig. 1.

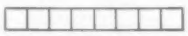


Fig. 2.

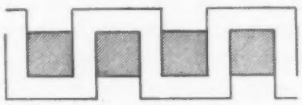


Fig. 3.

Fig. 4

Fig. 5.

$4 \div 3\ 1/5 = 1\ 1/4$.

$40 \times 1\ 1/4 = 50$, number of threads and picks required for the new goods.

$1\ 1/4 \times 1\ 1/4 = 1\ 9/16$.

$15 \times 1\ 9/16 = 23\ 7/16$, number of yarn required for new goods.

It may be supposed that the contraction in the warp between the two cloths might be different, which would necessitate using a finer or coarser yarn, but upon reflection it will be seen that this factor remains the same as shown in Figs. 3 and 4. The yarns in these two drawings are also shown square instead of round. The outlines represent the warp, the shaded portions the filling. In both drawings the warp is one-half the diameter of the filling, and therefore represent the yarn numbers in the proportion of 4s for the warp and 1s for the filling.

To make cloth of a length representing eight squares, the warp must be twelve squares in length. Reducing the weight of the cloth to one-half, as in Fig. 2, will require 4s yarn for filling and 16s for warp.

For the same length of cloth as in Fig. 1 the warp is also of a length equal to 24 half-squares or 12 whole ones.

Of course some slight modification must be made in individual cases, as a heavier cloth will naturally be woven under a higher warp tension than a light one, but such variations are so small as to be practically negligible.

Because the examples given are all based on square construction, it is not to be inferred that only this class of goods can be converted into another weight. By applying the same rule to both warp and filling, goods can be changed that differ widely in construction. We may have a piece of fancy goods with satin or twill stripes of different yarn numbers. The relation of these cloths is the same, but the different yarn numbers must be multiplied individually.

Take for illustration, a piece of 40-inch cloth with 42 picks of 16s filling. There are 39 stripes of satin, each 1/4-inch wide, made of 25s yarn with 20 threads per stripe. The ground is 20s yarn with 54 threads per inch. The cloth weighs 2.85 yards to the pound. If a 3.42 yard goods be asked for the calculation is as follows:

$3.42 \div 2.85 = 1.2$.

It is seen here that the yards per pound of the cloth wanted is divided by the yards per pound of the cloth to be duplicated, which is the same as dividing the weight of the latter by the weight of the former. The relation of weights is, therefore, as 1 to 1.2. The new cloth requires:

$42 \times 1.2 = 50.4$, picks per inch.

$1.2 \times 1.2 = 1.44$.

$16 \times 1.44 = 23.04$, filling.

$20 \times 1.2 = 24$ threads per 1/4 inch in satin stripes.

$25 \times 1.44 = 36$, No. of yarn for satin stripes.

$54 \times 1.2 = 64.8$ threads per inch in ground warp.

$20 \times 1.44 = 28.8$, No. of yarn for ground warp.

It is well known that a theoretically correct print cloth is one that has an even number of threads in warp and filling, and warp and filling are of the same number of yarn. On referring to many authorities it can be seen that by extracting the square root of the yards per pound of any number of yarn and deducting 7 per cent. for cotton the number of threads that will lie side by side is obtained. Making a trial along these lines, however, the reader will soon find that by deducting 17 per cent. he will come nearer the correct result. For No. 1 yarn this would give 24 threads per inch. As the warp and filling intersect one another, and one diameter of the warp takes the place of one of the filling and vice versa, we can put in only one half this number when we are making plain cloth. Such cloth, however, will show little holes in the form of squares, and as in many cases this would be objectionable, a modification takes place in the form of an increased number of ends in warp or filling or both. This is especially easy to perform, as threads of any kind are easily compressible. Usually, however, this increase takes place in the warp as weaving cost plays a very great item in the total cost, and by cutting down the number of picks a larger production can be made with a corresponding decrease in cost.

If another than a plain weave is used, say a 4-leaf twill or satin, the number of the threads in the theoretical cloth are in the same relation as the total threads in repeat of pattern to the added diameters of the two systems. Plain cloth repeats on two threads with four diameters of yarn and the corresponding picks and threads that will lie side by side are multiplied by the number of threads in the pattern and divided by the added diameters. If 48 threads of No. 4 yarn will lie side by side, the cloth would be:

$48 \times 2 = 96$.

$96 \div 4 = 24$ threads and picks.

Fig. 5 shows an 8-leaf satin:

$48 \times 8 = 384$.

$384 \div 10 = 38.4$ threads and picks.

This gives the following rule:

Multiply the threads that will lie side by side by the number of threads in the repeat of pattern and divide the product by the total diameters.

To make a very smooth surface, however, as in sateens, usually one of the systems of threads is increased considerably with a corresponding decrease in the other, this giving the same warp or filling face as the case may be.

Some work in calculation can be saved by multiplying the standard threads per inch of No. 1 yarn by the square root of the other yarn. This saves the rather lengthy multiplying of 840 yards by the yarn No. and then extracting the square root.

Very much more could be written on this subject, but for persons interested in these problems it is advantageous to make trials for themselves and thus gain practical knowledge which is so great a help when one knows how to overcome the confronting problems by theory.

HINTS FOR TWISTING ON RING FRAMES.

In the designing of ring twisting frames machine builders have followed shop models altogether too closely, and neglected to adapt the various parts of the machine to the particular object to be obtained. As a consequence yarn twisters leave much to be desired in respect to both quantity and quality of production. In the first place a good self-oiling spindle must be used, and, especially for coarse yarn, the spindle should have a long bearing. If the lower part of the spindle and the bearings are too short the spindle will begin to vibrate excessively within a year after having been started. Likewise the rings should be made of the best material and when they become worn should be replaced with new ones, because otherwise, not only is the production injured, but the wear on the travelers is greatly increased. The grinding of worn rings is not advisable. The cost of the process amounts to nearly one-half that of new rings, the wearing surface of the reground ring is softer and the travelers fly off the ring more easily.

It is important that proper proportion should be maintained between the size of spindle, diameter of the bobbin, width of the ring and length of the spool. For coarse yarn in which there should be as few knots as possible, a large ring is advisable, in order to permit the use of a large bobbin. It is a mistake, however, to use an extremely long bobbin, as the excessive weight of the bobbin and yarn causes a rapid wear on the spindle. Following is a list of suitable sizes:

Gauge.	Diam. Ring.	Length Bobbin.	Size of Yarn.
2 3/8 in.	1 5/8 in.	4 in.	2/60—2/200
2 5/8 "	1 3/4 "	5 1/4 "	2/40—4/150
2 3/4 "	2 "	5 1/4 "	2/20—6/80
3 "	2 1/4 "	5 1/2 "	2/12—6/44
3 1/4 "	2 3/8 "	6 "	2/6 —6/36
3 1/2 "	2 5/8 "	6 1/4 "	4/16—6/18
4 "	3 "	6 1/2 "	4/4 —6/10

In twisting fine yarn a larger production can be obtained by the use of smaller and more easily running spindles, and small rings to allow of high speed of the spindle. With fine yarn there is less advantage in a large volume of yarn on the bobbin, because of the relatively greater length of fine yarn. The form of bobbin shown at Fig. 1 is used in order to permit drawing the yarn over the top. It is advisable to have the head on the spool covered with metal (m), in order to facilitate the passage of the yarn. The bottom of the bobbin should be fitted with a steel plate to correspond with the catch on the spindle in order that the bobbin may be held firmly in position during the twisting process. Only those bobbins should be used which fit the spindle exactly and are perfectly balanced.

FIG. 1.

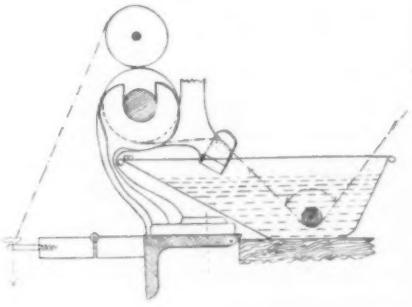


FIG. 2.

Very often the vibrations of the spindle are due more to the inequalities of the bobbin than to a defect in the spindle. The spindle bands should be tight in order to obtain uniform twist in the yarn. Slack bands should be removed as soon as discovered. Spindle banding is much improved by being stretched when in a wet state before being put on the twisting machine. The uniform tension of the spindle bands results in a more regular twist and a larger production because the increased efficiency of the spindle makes it possible to run the rolls somewhat faster and still obtain as many turns per inch.

The trough is an important feature of a wet twisting machine. In most cases the English trough is used, and should be fitted with adjustable glass rods when different sizes of yarn are to be twisted. Coarse yarn takes up the water more quickly than fine yarn and should, therefore, remain in the water but a short time. Fine yarn (above 2/60's), should not be bent at sharp angles during the process, and as a consequence the glass rod for the fine sizes should not be less than 1/2 inch in diameter.

The trough shown at Fig. 2 should be so shaped that it will reach far enough forward to catch the water which drips from the rolls. A Scotch trough is often preferred for fine twist because the lower roll is partially submerged in the water. By this arrangement the fine yarn, which absorbs liquid more slowly, remains in the water a longer time. The glass rod and consequent friction of the thread is also avoided.

Each spindle should be equipped with a hinged thread board fitted with pigtail hooks to guide the thread from the rolls to the traveler. Stationary glass guides are not advisable, because it is necessary to set them higher, and, consequently, the spindle cannot be run at as high speed on account of the ballooning of the thread. It is important to have the thread guide directly over the spindle and the frames should be examined regularly to test whether the guides are in proper position.

The yarn to be twisted should be wound from the spinning cops on to larger spools. If twisted direct from the cop the tension on

the yarn varies widely and there is much greater loss of time in changing bobbins. The doubling spools are usually placed on horizontal spindles on the twister, but for fine yarn it is advisable to have the spools placed on wooden spindles inclined somewhat toward a vertical position. The object of this is to reduce the friction. (Translated from Leipziger Monatschrift fuer Textil-Industrie by the Textile World Record.)

ENGLISH NOTES.

(By our Special Correspondent.)

Outside the lower woolen branches it is hard to hear any complimentary thing said of the state of trade. Textiles have shared unduly in the business depression that has beset most British industries for a while back. Now we are beginning to hear of failures in manufacturing and mercantile circles. Nothing sensational is apprehended and worsted failures have been made inevitable by the contrary courses of the markets. It is possible even to find a gleam of hope in the tale of disaster. In Yorkshire at least the failures occur after the worst of the storm and some experienced mariners look on them as harbingers of better conditions. At the same time it has to be admitted that wool values and cloth values are irreconcilable and anxiety must be the portion of the masses until demand shows new vigor. It would be serious indeed if the early New Year marked a decline rather than an increase in the appetite of consumers. That contingency, however, is scarcely contemplated.

Japan's orders for cloths have been mentioned previously in these notes. In March, one is able to say, there will be large contracts let for yarn and no time is to be lost by those desirous of seeing samples. Fourfold white hosiery yarn will be wanted; some dry-combed and some combed in oil. Germany has had already orders for more than half a million pounds of the former and English firms have secured more than half as much of the latter by contracts now under delivery. A good merino quality is used and prompt delivery is exacted. It is well, perhaps, to add that absolute conformity with samples is a first necessity of the case. Japanese buyers show no hesitation in declining goods that are ever so little below their standard. The Japanese attitude contrasts oddly with that of our own government. One has been assured by a firm which dyed many thousand pieces of Khaki during the late war, that a considerable quantity were too tender to handle safely until strings had been run lengthwise down the two lists.

Odd stories are told of the adventures of English exporters with the U. S. customs officials and American customers. One that is true of an American importer who approached various manufacturers of costly goods for men's wear in the effort to find one willing to invoice consignments at a discount of thirty-three per cent. Many firms refused but one foolish fellow gulped down the bait. He shipped for a whole season and wrote frequently for payment of the suspended thirty-three per cent. which, by virtue of secret agreement, he was to receive later. The months slipped by bringing no cash and the seller sailed for New York. His reception was chiling. He was informed that rather than pay the buyers would expose the whole proceeding and with a thousand pounds' worth of new experience the victim of the swindle returned home.

The Claflin Company is putting notices about which suggest that some evilly-disposed persons in England have counterfeited the registered marks and devices of the Massachusetts Cotton Mills and of the Dwight Mills. Similarity of labels and disputes about the titles thereto are a constant source of friction between English merchants. But perhaps cotton-producing America will be more concerned to know that the name "Americani" commonly used by African natives to denote 36 inch plain cloth grey in 30 yard lengths is being used every day upon Lancashire cloths. There is reason to believe that Central Africanders do mistake for American cloth that which issues from English looms.

A great strike of lace-makers in Nottingham serves at least to illustrate some comparative rates of wages. The basis is the "rack," or 1,920 motions of the machine and

in the town of Nottingham payment per rack ranges between 5 1/2 pence and 9 pence regularly and goes as high even as 12 pence. In Lyons (France) workers can be got at 2 1/2 pence. The Nottingham difficulty arises from this competition and that of the surrounding country districts; in which last, prices are from 4 1/2 pence to 6 1/2 pence. Against the manufacturers it is urged that they cling to obsolete machines which are capable of only 180-250 ranks per week against the modern capacity of from 220-300. From the workman's point of view the trouble is that he can no longer earn the $30-$35 per week of twenty years ago. To-day, in full work in Nottingham, the lace-maker may earn from $12 to $20 at the most. Outside the city he must content himself with between $10 and $15. It seems plain enough, however, that the lace-workers' pay is to be reduced.

Leaders of the Lancashire cotton industry take a complaisant view of the situation of the market. They are well content with the financial results of their short-time strategy and by keeping cool heads now that fluctuations are feverish they anticipate sound profits during 1905. Talk of a boom is deprecated. The situation of many spinners of American staple is actually better than in boom times. Not a few mills are engaged to their utmost for a straight run for nine months at prices that are undeniably satisfactory. Foreign customers hardly realize this truth as yet and the offers they put forward are accordingly low. Egyptian spinners are in a different situation, but for the majority the outlook is encouraging.

The metric system has found a foe in Great Britain in the British Weights and Measures Association whose secretary, Geo. Moores, F. S. S., 25 Victoria St., London, S. W., has been specially interviewed for The Textile World Record. Mr. Moores is a man imbued with the strength of an impregnable case. His committee is composed of men who are practical as well as scientific. Mr. Adams, manager in Europe for the Sturtevant Co., is one. The membership includes our largest dock-contractor, our leading railway engineer, one of the greatest of the world's shipbuilders and engineers in the main branches of the profession. There are no theorists or ornamental gentlemen on the Board and the work they are doing is such as one might expect. The Association binds itself to no new notion. It aims only to defend us from the invasion of the metre. It views with a non-committal sympathy the efforts of those who would construct a decimal system based upon the inch and the pound. The Association lives not to prevent reform but to stave off reaction and to induce the public to look before it leaps.

The Association keeps in close touch with makers of measuring-rules and tabulates truths about the orders these tradesmen receive. One order for that "metric" country, Japan, was for 700 dozens of which one-third were metric and two-thirds English. These rules were for government service, be it said; and the Japanese official who called to inspect the manufacture assured the rule-maker that the metre was virtually disestablished in his country.

Russian rules have English inches (the same as the Russian duim) outside and Russian 1 3/4 inch divisions (verschok) inside.

China, the Straits Settlements, Persia and Hindustan all cling to the convenient English inch. One would suppose that those who favor the metre had never seen the handy and legible English folding foot rule alongside of the cumbrous and illegible French metre-measure. For elementary purposes no contrast could well be more convincing. No bricklayer less agile than a Frenchman could perform the operation of opening his metre rule without falling from his scaffold. After the opening the laborious business of straightening comes and after that the workman had better strike his match to read the figures.

Jerome, who wrote a series of rules for the education of girls in the year 378, recommends among other things that she "learn also to spin wool, to hold the distaff, to place the basket in her bosom, to twirl the spindle, to draw the threads with her thumbs. Let her despise the webs of the silkworms and gold beaten into threads. Let her prepare such garments as may dispel cold, not expose the body naked, even when it is clothed."

CUBAN COTTON.

Cotton is being grown in Cuba with varying success by the many American settlers that are pouring into this country. The presence of the boll weevil has deterred some from going into it very heavily, but there are reports of a very successful growth of the Sea Island variety, with a long and silky fibre which would command the highest price in the northern market.

The accompanying illustrations are made from photographs taken on the farm of J. Condet Smith, near Bemba (Jovellanos) Cuba, and show the marvelous growth of the cotton plant here, in some cases it reaches as high as a man's shoulders. Some of the cot-

ton bolls can be seen just breaking out, and one of the plants has 265 bolls. The view of the field, containing 120 acres planted with cotton, gives some idea of the beautiful Cuban scenery with the royal palms in the background and the faint outline of hills in the distance.

SAN JUAN.

A SUBSTITUTE FOR THE DABBING MOTION.

Success in combing wool for worsted depends largely upon how well tne stock is pressed into the needles of the two circles. This result is ordinarily accomplished by a brush 3, Fig. 1, vibrating rapidly in a perpendicular direction and forcing the wool into the needles of the large circle, 11, and of the small circle, 12. The rapid motion necessary to accomplish this and the great wear on the brush makes this part of the comb not only expensive but difficult to keep in order.

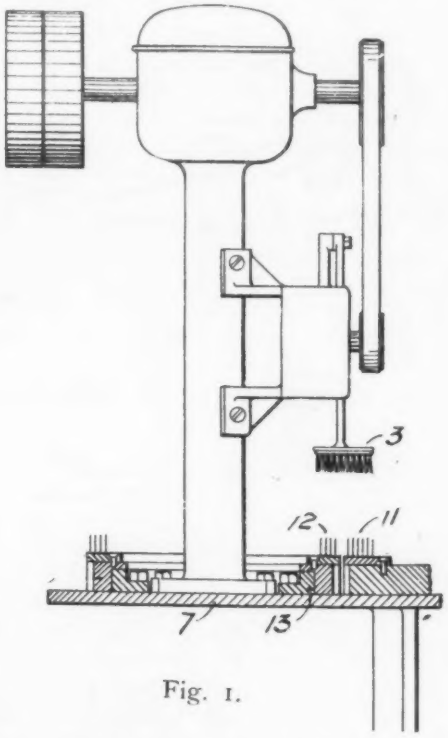


Fig. 1.

Various devices have been proposed for the dabbing brush, but up to this time they have failed to win their way into general use. These have consisted usually of beveled knives adjusted between the rows of needles and forcing the stock down as the circles re-

volve. The difficulty with such a device has been the practical impossibility of preventing the knives from striking and breaking the needles, this result following the slightest disarrangement of either needles or knives. A device has recently been patented in this country to dispense with the dabbing brush and to overcome the objections made to previous substitutes.

Fig. 2 is a vertical section of a comb showing the attachment; Fig. 3 shows the device set in working position between the circles;

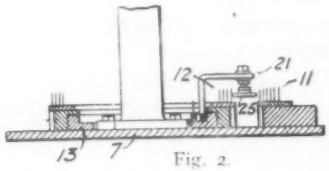


Fig. 2.

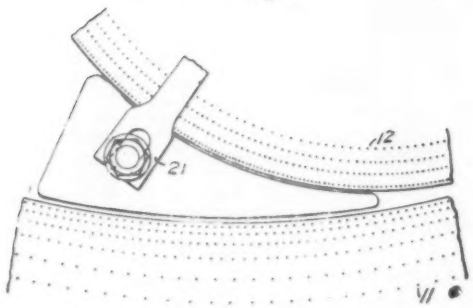


Fig. 3.

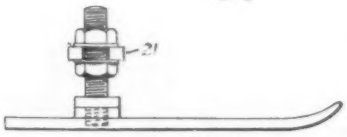


Fig. 4.

Fig. 4 is a side view of the attachment. To the ring, 13, or, if desired, to the bed, 7, is fixed by an adjusting-screw, 18, the base of the new device, which in detail comprises an upright rectangularly bent arm with a bifurcated extremity, 21, traversed by a threaded pin. This pin is vertically adjustable by nuts, provided with washers, bearing upon the upper and lower faces of the bifurcated extremity, 21, of the arm. The lower extremity of the pin enters the upper face of a flat shoe, having a broad heel and pointed toe, the whole resembling somewhat an isosceles triangle with its longer sides curved. The toe is slightly upturned from the horizontal plane of the remainder of the shoe.

By means of the screw, 18, traversing a slot in the base of the device, the shoe-point may be advanced to any desired distance from the point of intersection of the large and small circles, while the degree of depression of the fibres may be regulated by the adjustment of the vertical pin.

The device described when adjusted as indicated guides the slivers which contact with the toe downwardly to a plane even lower than the bases of the comb-teeth if such extreme adjustment is desired, and thereby insures against any subsequent material elevation of the fibres. It will be noted, further, that under no circumstances does the device come in contact with the comb-pins.

THE FIRST POWER LOOM IN AMERICA.

Easthampton, Mass., Nov. 21, 1904.

Editor Textile World Record:

In a note on page 127 of your October issue it is stated that the first power loom in America was set up at Waltham in 1815. I take the liberty to send you a little historical information bearing upon the matter:

"In 1809 a power loom capable of weaving about twenty yards of coarse cloth per day was in operation at Dedham, Mass." "The first mill in America (if not in the world) where a power loom was used and spinning and weaving were carried on under the same roof was erected at Waltham, Mass., in 1813, by Francis C. Lowell, Patrick T. Jackson and Paul Moody. It ran 1,700 spindles." This factory is still in operation.

The following may also be of interest:

"Mr. Francis C. Lowell of Boston, Mass., who had made a voyage to England and visited Scotland returned from abroad in 1812 and he, in conjunction with Patrick T. Jackson, a relative, undertook the invention of a loom and in the autumn had completed a satisfactory model and decided upon erecting a suitable mill to operate it."

JOSEPH HARGREAVES.

Japan in 1903 had 1,292,334 cotton spindles, using 391,546,000 pounds of cotton.

AN ENGLISH KNOTTER.

A simple device for tying knots was invented in England a short time ago, and is said to have proved very serviceable. The inventor has had the knotter patented in the United States, and he describes it as follows:

The object of this invention is to provide a simple form of knotter to enable winders and others to readily and speedily knot two ends of thread or the like together.

Fig. 1 is a front view of the knotter. Fig. 2 is a front view of a knotter with an attached handle. Fig. 3 is a side elevation of Fig 2. Fig. 4 is a view showing the position of thread when forming the knot. Fig. 5 is a view showing the knot formed and slipped off the knotter in position for the loose ends to be severed, and Fig. 6 shows a different form of the device.

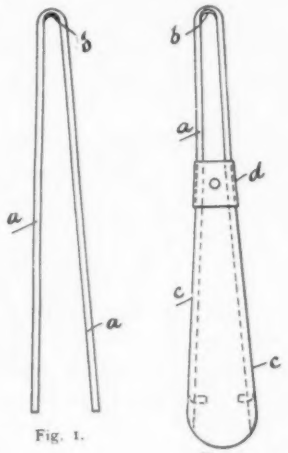


Fig. 1.

Fig. 2.

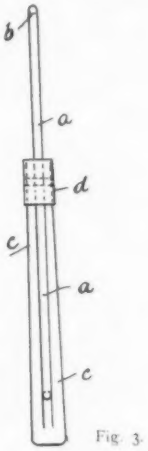


Fig. 3.

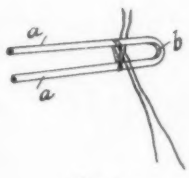


Fig. 4.

Fig. 5.

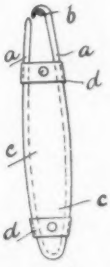


Fig. 6.

A piece of steel or other suitable wire, a, of a convenient length is bent into an inverted-U form somewhat like a hairpin, as shown at Fig. 1. The inner side of the bend or loop at (b) is filed to a cutting edge. The legs of the inverted U may be bent or formed in any suitable way for convenience of handling; but it is preferable to bend the ends inward and attach the wooden handle, c, as shown in Figs. 2 and 3. The sides of the handle are grooved to receive the wire, which is secured to the handle, c, by means of a metal ferrule, d.

The person using the knotter holds it in one hand and in the other takes the two ends together, then passes the two pieces of yarn around the legs of the U in a coil and draws the extreme ends through the space between the coil and the cutting edge of the loop, as shown at Fig. 4, then slips the coil upward off the ends of the loop and legs, so as to form a knot, and gives a sudden pull at the two pieces together, whereby the knot is pulled tight and the short projecting ends are cut off. These short ends may readily be removed by the thumb and finger.

Fig. 5 shows a modification in which only one leg, a, of the U-shaped wire carries the cutting edge, b. A handle, c, with bands, d d, holds the two legs, a a, together. One of the legs, a, is curved and sharpened to form the cutting edge, b. The other leg is adjacent to the cutting edge, but its only function is to assist in forming the knot.

MANAGEMENT OF A DRESSING ROOM.

BY THOMAS BARR.

Three essential points in the dressing room to get the best results are the slasher man, the size and the slasher, and I have placed them in what I think is the order of their importance. I have found that in any part of a mill, a poor man and the best machinery will result only in poor work. The slasher man is very important in getting good work from the dressing room. When manufacturers boast that they can get all the dressers they want for $8 per week, it is no wonder that the poor weavers get discouraged with the work they receive from the dressing room. Superintendents and overseers should get their eyes open before it is too late.

Sizing is indeed a very important factor in delivering good warps to the weave room,

but as every overseer has his own ideas on the subject, I will give a few hints on only the most important points. The greatest fault I find is that nearly all men boil the size only 30 to 40 minutes. I always get the best results when it is boiled at least one and a half hours. It is better to test it by placing a few drops between the thumb and finger and rubbing it down as an engineer tests oil. It should be smooth with a slight sticky feeling and look good enough to eat. On an average I use 75 pounds of starch and eight pounds of tallow to 100 gallons of size.

I prefer a ball-bearing slasher with side shaft for 2,000 ends 30s yarn and 3,000 ends of 40s yarn; for warps from 300 to 900 I should want the gear driven cylinder.

There are three points to watch on the slasher if the best results are to be obtained. First, the blankets must at all times be kept in good condition with enough blankets to make a good cushion sufficiently firm to squeeze out the size. Second, there should not be too much cloth on the tension or front drawing roll, otherwise it will not only stretch the yarn, taking out the elasticity, but in many cases break the ends. Third, the friction on the beams should not be hard for the first three cuts, otherwise it will have the same effect as too much cloth on the roll.

By carefully following these few points one may expect good results in the weave room.

THE ADULTERATION OF WOOLEN CLOTHING SOLD IN MELBOURNE ND SUBURBS.

A Report to the Board of Public Health, Dec. 22, 1903, by W. Percy Wilkinson, Government Analyst for Victoria.

The Inspectors of the Board of Public Health, acting under instructions from the chairman (Dr. Gresswell) handed me portions of certain articles for examination on various dates mentioned in the attached detailed lists.

It was stated by the inspectors that the articles were sold in response to demands for "woolen" clothing. Each article was marked and sealed. The total number of samples submitted was twenty-five. They represented socks, sweaters, undershirts, underpants, tweeds and flannels.

Preliminary examination of the threads, constituting warp and weft, or of the knitted yarns, showed that a number of the articles did not consist wholly of wool, and that cotton in part had been substituted.

The percentage of cotton present was determined according to the directions issued by the German government for use in the customs examinations of textiles. (Amtliche Verordnungen und Erlasse. Anleitung zur Bestimmung des Baumwollgehalles im Wollengarn, 6 February, 1896.) Complete details of this process are given in Fresenius, Zeitschrift fur Analysische Chemie, 1896; in Lunge, Chemisch-technische Untersuchungsmethoden, 1900, Vol. III, p. 1036, and in Elsner, Die Praxis des Chemikers, 1900, p. 588.

It has been pointed out that the official German method indicates a higher apparent percentage of wool than is really present. This is stated by Hunger (Zeitschrift fur offentliche Chemie, 1898, p. 160) to average 4 per cent. In the detailed statement of the analyses this correction has been omitted, so that the figures reported for cotton percentage are in reality below the actual amount present to the extent of about 4 per cent.

In each case the purity of the separated cotton was further checked by staining the isolated threads of the warp and weft, or of the separated knitted yarns, by means of an aniline dye and verifying the absence of woolen threads by microscopical examination (Manget, Ch., Tableaux synoptiques pour l'examen des Tissus, 1902.)

The result of the analysis was that seven of the twenty-five articles were found to consist entirely of wool, while eighteen contained cotton in amounts varying from 5 per cent. up to 66 per cent., the average amount of cotton present being 44 per cent.

In a former report on The Adulteration of Linen sold in Melbourne (L. P. No. 734 A 4 Aug., 1903) the extensive substitution of linen by means of cotton was shown to be largely practised. The present examination shows that similar fraudulent misrepresentation exists to a very considerable extent in the case of the so-called "woolen" articles sold in Melbourne and suburbs.

As in the case of linen, purchasers of

woolen cannot protect themselves against frauds of this nature; only a highly trained eye could distinguish the partial substitution.

It is truly deplorable that the public of Victoria, one of the great wool-producing countries of the world, should be so covertly tricked with wool-resembling goods of such false description as disclosed by this examination.

NOTES FROM ENGLAND.

BY J. H.

Upon arriving in England, after a very pleasant voyage, the elements greeted us with their damp, cold, gray consistency which obtains at this time of the season. My remarks as to the dismal aspect met with the rejoinder, "Oh, we have had good weather of the old sort, you know." And such, I believe, has been the case. This kind of weather in England is an indication of pleasure and business. The varied pleasures of the people are enhanced or curtailed in accordance with the brightness of the weather. Style of costume, kind of material, quality of design and all that tends to make up the gay and gorgeous depends upon the fitful summer, the dress of the toiling multitude as well as the more fortunate is compelled to conform to the exigencies of the seasons, which in turn has a great effect upon the cotton cloth business of the country; the manufacturers and merchants watch with a keen eye the progress of the seasons, because of the styles they have determined to hold in stock, in anticipation of trade requirements and repeat business. In speaking to many fancy manufacturers I found that a good trade is expected as a result of the good summer just experienced.

The plain trade is very good. On all sides I heard it expressed that not for some years past has there been such a demand for plain fabric, most of the mills being engaged for months ahead. The complaints come mostly from fancy manufacturers, yet underlying their complaints there is a confidence of much better times. Lancashire is the home of the cotton cloth industry. Here the requirements of most of the world's markets are studied and catered to with a keen competition, not of price only, but of construction and design, which brings out results that would not otherwise obtain. There are fresh and significant evidences of the revival and growing prosperity of the cotton trade in Lancashire, new mills being erected in different parts of the country, Oldham, Bolton, Preston, Farnsworth and other places are at present erecting new mills, both for spinning and weaving.

The room and power system which has been operative in some districts is likely to extend to others with beneficial results. This room and power system consists in the building of a large weaving shed and renting to small manufacturers a section varying in size according to the wishes and capital of the person or persons desiring to be thus accommodated. This system has worked very successfully in Nelson and Colne, two prosperous northeastern Lancashire towns. Other places have also adopted this system.

I am of opinion that the balance between the English and American manufacturers lies with the English in the production of new effects and design in the cotton cloth fabrics. There is quite a difference in the manner of working which to some extent may be more helpful to the English manufacturer and merchant. On this side the merchants are continually endeavoring to obtain something new. The means used are various; to a great extent they rely upon the genius of their designers to keep pace with the demands for new fabrics. In addition to the original productions, merchants and manufacturers get a great many ideas from silk clippings. There are persons in Paris and elsewhere whose occupation is to collect all the good effects, productions of both hand and power looms. These they send to their subscribers among whom are the merchants of Manchester and many of the manufacturers of Lancashire. These samples are examined very carefully with a view to rearrangement, new combinations, and general development, according to the ability of those whose duty it is to deal with them. The value of these collected samples depends wholly upon the use the designer is capable of putting them to. I know that by such means

some of the best styles and newest effects have been developed for the English market.

Whether rightly or wrongly, my observations while in America lead me to conclude that there is a fundamental difference in dealing with the productive capacity in construction and design. In England the fancy cotton market, represented by the merchant, waits upon and is led by the productive ability of the manufacturer and designer in the new styles which are presented from season to season. There is a personal co-operation between the merchant and manufacturer, for each manufacturer, whether great or small, comes into direct contact with the merchant at least twice a week and sometimes oftener when they compare notes, exchange confidences and ideas which result to their mutual benefit. The persons attending the market in the interest of the different firms or corporations are mostly experts and therefore capable of dealing with the many problems which come forward for elucidation in the quickest possible manner. The merchant is continually calling upon the different manufacturers for something new, and each mill is vying with the others in new effects, which means new and good business for them; thus the creative ability has an incentive to higher attainments.

The method is somewhat different in the States. The mills have to a great extent to wait for a lead from the selling houses. The same methods could not be employed in America as in England. The geographical situation of the mills prevents the same personal intercourse; other circumstances possibly prevent the full scope of the talents which are in the mills, yet it cannot be denied that it is a great disadvantage to the full development of an industry when the experts on the distributive side and the experts on the productive side are so little in touch. If these two factors were brought together with a view of exchanging ideas one fully competent to know the capacity of the mill, the other able to grasp the uses to which different fabrics might be put, a mutual benefit would result, not only to those directly interested, but its influence would be shown in a higher grade of products.

COMMERCIAL MUSEUM OF THE PHILIPPINES.

On October 22, 1902, by an Act of the Philippine Commission, there was established at Manila, P. I., the Commercial Museum of the Philippines, a branch of the Philippine Museum of Ethnology, Natural History and Commerce. The Museum is strictly a governmental institution having for its object the extension of the foreign and domestic trade of the Islands and to encourage the development of the resources of the archipelago. It collects, arranges and exhibits the commercial products of the Islands as well as receiving and exhibiting such products of other countries as are suitable for the markets of the Philippines. A feature of the Museum, which will appeal to our manutacturers, is that it furnishes, as far as possible, without cost, commercial data called for by importers, exhibitors and all others interested in the development of our island possessions and the extension of American trade. Manufacturers and exporters of the United States may place exhibits in the Museum free of charge. It is to be remarked, however, that there is a notable absence of exhibits from our textile manufacturers. Great Britain, Germany, France and Spain are well represented and cotton goods and cloths of light and medium weave from those countries are securing a ready market in the islands.

When the proposed reduction of the Philippine tariff becomes effective an excellent and profitable market will be found in the Islands for the products of our American looms. Thus far the trademark of an American manufacturer has proved a good recommendation for any article, and although there is a tendency to buy cheap goods the better class of customers are demanding the best grade of articles and in the long run meritorious goods will win the market. The natives, as a rule, use the best goods they are able to buy, still, it may be worth while to bear in mind that the majority of them are poor and buy cheap goods.

Only a few years ago there were practically no American goods on the Manila market, but since our occupation of the Islands a

number of enterprising American manufacturers have successfully placed their goods. Many classes of American manufactures, that are not now sold in the Islands can make a market and create a demand for themselves if they are properly brought before the public. LOUIS G. REINBERG.

THE INFLUENCE OF TWIST ON THE CLOTH.

BY A. CRABTREE, in The Textile Manufacturer.

The various items in cloth structure which affect the prominence of twills and other weaves of a similar nature are in a general sense well known. The most important of these are: 1, weave; 2, reed, pick, and counts; and 3, direction of twist and quality of yarn. The reasons for the influence of the first two of these items are so apparent as to require little or no explanation. Broadly speaking, the influence of these lies chiefly in the manner in which they affect the length of the floats. As a general rule it may be taken that the longer the floats on the face of the cloth and the coarser the yarn, the more prominent will be the twill. The third of the items mentioned above is of at least equal importance, though of course the prominence of the twill is affected in an entirely different manner. The actual effect of the direction of twist in the fabric is fairly well known, but the exact reason for the effect produced does not appear to be so, the scientific principle underlying these well known effects being widely misunderstood. The generally accepted rules for obtaining the best results in twill weaves is to have the warp and weft yarns spun in opposite ways, so that when the face of the cloth is examined the fibres in both warp and weft appear to run in the same direction. The twill should be run in the opposite direction to the line of the fibres.

In an ordinary cotton twill, the warp is spun twist way, and the weft spun weft way. When put together in the cloth, the fibres of both warp and weft appear to run diagonally across the cloth from left to right. The twill is, therefore, according to the above rule, run diagonally from right to left, as is shown diagrammatically in Fig. 1. If two pieces of cloth be examined, woven from exactly similar yarns, but with the twill running in opposite directions, it will be seen that the piece in which the direction of the twill is opposed to the direction of the fibres is much more prominent than the other. The exact reason for this is often stated to be due to the fibres of warp and weft embedding themselves into one another, or not doing so, according to the direction of the twist in warp and weft. Thus, if the two yarns are twisted in the same direction, the fibres are supposed to lie in the same direction at the point of contact, i. e., the face of one thread and the back of the other, and thus lie more intimately together, producing a close, even fabric. On the other hand, with warp and weft twisted in opposite

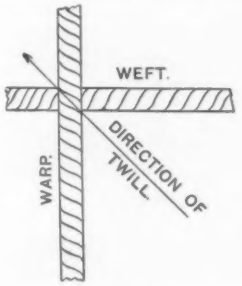


Fig. 1.

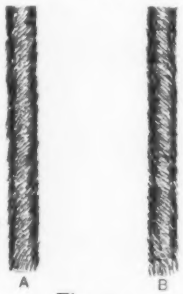


Fig. 2.

respectively, and woven from similar yarns. directions, the fibres cross one another at the point of contact, and are therefore supposed to lie farther apart. It is more than doubtful whether there is any such action in any fabric, at any rate to such an extent as to make an appreciable difference in the appearance. In any case, it is certain that this would not cause any difference in the relative prominence of two twills, running to right and left respectively, and woven from similar yarns. In such a case as this, if the fibres embedded themselves at all, they would do so equally in both cloths.

Some time ago the writer carried out a series of experiments and investigations with a view to finding a more satisfactory reason for these phenomena. The result of these investigations is to show that the real reason for the influence of the direction of twist in twill weaves is almost entirely to be found

in the peculiar manner in which the light is reflected from the threads when curved, as they are in the cloth. In studying these effects a microscope with low-power objectives, say 2 1/2 and 1/2 in., will be found of great service, though in many cases the effects are plainly observable through a good magnifying glass.

Fig. 2 shows the manner in which the light is reflected from cotton threads when in a straight position, A being a twist-way, and B a weft-way thread. It will be noticed that the brightest part of the thread is in a line down the centre (assuming the light to come from behind the observer, this line of reflection, as it may be termed, being in reality composed of a large number of separate reflections from the individual fibres. Each

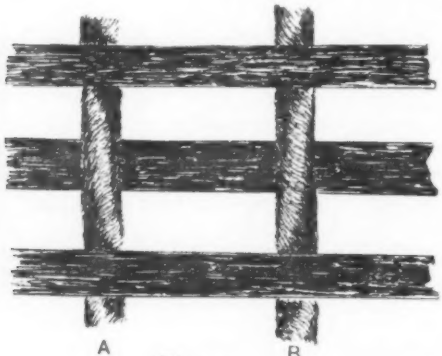


Fig. 3.

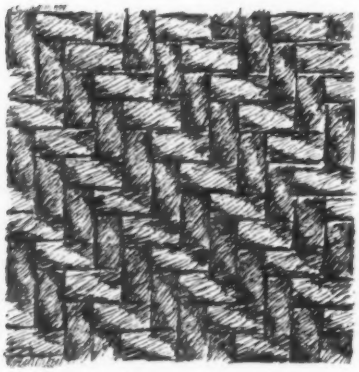


Fig. 4.

fibre is, of course, in a curved position, and consequently reflects the light most strongly to the observer's eye from one particular point; and as the fibres on the face of the thread are all at approximately the same angle, these reflecting points all appear in the same line on the thread itself, thus forming the above-mentioned line of reflection. The

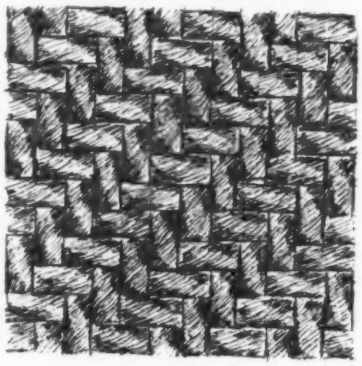


Fig. 5.

Fig. 6.

effect is practically the same in both twist and weft-way yarns. If, however, the threads instead of being straight, are curved, as they are in the cloth, the line of reflection is completely changed, and instead of lying in a straight line, it will be found to run diagonally across the thread at the curved part.

The diagonal line of reflection is not the same in twist and weft-way yarns, but runs in opposite directions, always, in fact, running across the line of the fibres. This is shown in Fig. 3, which represents two threads, A being twist-way and B weft-way yarn, both represented as bent round a series of rods. It will be seen that in both cases the line of

reflection runs diagonally across the thread in the opposite direction from the line of the fibres, although the lighting in both cases is the same. The reason for this phenomenon will be readily understood if it be remembered that the line of reflection is made up of the reflection from the individual fibres. The effect of curving the thread is to cause the fibres to present different angles to the observer's eye and the source of light, and consequently the brightest point on each individual fibre may be deflected to the right or the left, according to the direction in which the thread curves. The effect is that when a thread is bent upwards, as in cloth, the line of reflection invariably runs across the thread in a direction opposed to the line of the fibres. A simple experiment may be easily made which will show the action more clearly than any explanation. A model of cotton yarn may be made by laying together sufficient strands of sewing cotton or other similar thread to form a cord about 1/4 in. thick. This may be taken between the fingers and twisted in either direction so as to form a fairly good representation of a cotton yarn, in which the individual strands of sewing cotton represent the fibres in the yarn. By bending this model thread over the fingers, and twisting it in opposite directions, the effects shown in Fig. 3 may be readily observed and studied.

An examination may now be made of a twill fabric, and the effect of the line of reflection from the threads when in the cloth observed. Taking as an example the 2 by 2 twill weave, Figs. 4, 5, and 6 show enlarged views of such a fabric, woven with twist-way warp, but varied in the weft. Fig. 4 shows the cloth as usually made with weft-way twisted weft, and the twill running to the left. It will be seen that the lines of reflection from the individual threads all run in the same direction, and also that they run in the direction of the twill. The result of this is that these lines of reflection join up to one another, forming continuous lines of light on both the warp and weft ribs, thus showing the ribs up very prominently. If this be compared with Fig. 5, a great difference is noticeable. Fig. 5 represents a cloth woven from exactly the same yarns, both warp and weft, but with the twill running to the right. A close examination will reveal the fact that the lines of reflection from the individual threads, although still running in the same direction as before, now oppose the direction of the line of the twill, and in consequence they do not in this case join up and form a continuous line of light, but both the warp and weft ribs are broken up into a series of short broken lines of reflection, running in the opposite direction to the lines of the twill.

The result of this breaking up is that instead of the ribs of the twill showing up boldly, they are much less prominent, and in some cases may be scarcely discernible. Not only is the twill less prominent, but the fabric is less lustrous in appearance, and, in fact, may appear in some cases to be of an altogether lower quality.

Fig. 6 is another representation of a 2 by 2 twill with the twill running to the left as in Fig. 4, but in this case woven with twist-way weft, so that the direction of the fibres on the face of the cloth is to the left in the weft, but remains to the right in the warp. The effect of this is clearly shown in the drawing. The warp rib is shown up prominently as in Fig. 4, owing to the lines of reflection from the warp threads joining up to form a continuous line. The weft rib is, of course, broken, owing to the lines of reflection from the weft threads opposing the direction of the twill. As would naturally be expected, the warp rib in such a cloth shows up prominently, while the weft rib is subdued.

Other cases might, of course, be dealt with in connection with the 2 by 2 twill weave, but the three cases given illustrate every point of importance. For example, if weft-way twisted warp and twist-way weft were used, a twill might be obtained running to the right which would be equal in appearance to Fig. 4, and so on.

Up to 1894 practically no worsted tops had been imported into the United States; in the next three years under free wool there was imported a total of 8,377,785 pounds of worsted tops and rovings.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Imperfect Yarn.

Editor Textile World Record:

I enclose a small sample of yarn which we have been making in this mill. It has been coming out well until recently when numerous small bunches, seen in the sample, appeared. We have been unable to locate the cause of the trouble and would like to have your opinion regarding it.

Seite (489).

1. The yarn appears to be No. 10 and is very uneven, the twist per inch ranging from 8 to 19. The stock is one inch, which is all right for this size of yarn, and I should say it was very well carded. The black bunches are caused principally by the black stock not drawing as evenly as the white, the black being left in a harsh state by the dyeing. The rolls are set to suit the white cotton and the black has to find its place in the sliver at random. This sample of yarn is not double and twist with one black and one white thread twisted together, but is made with a black and a white roving run together on the creel of the spinning machine. This is a very unusual method and can be accomplished successfully only with light slivers and short drafts. I have not weighed the sample, but the fact that the twist varies from 8 to 19 per inch, shows plainly that the slivers need some radical change before a suitable yarn can be produced by this method. Geiger.

2. The trouble with this yarn is the same as that which I had some years ago. I had the Whitehead evener on the pickers, and worked at them so as to make a good even lap and then set the cards accordingly. We had English cards of different makes and no railway heads. I had to decrease the draft or speed of the second roll and increase the speed of the third roll. Everything then came O. K. and I had no further trouble. Evener.

3. In my opinion the black bunches are caused by small bunches of waste dropping between the rolls, and some of the spots are caused by leafy cotton. Kenn.

I have examined the sample of black and white twist very carefully. Bunches such as it contains are often due to unevenness in the roving. This is especially the case when black roving is used, doubtless due to the dyeing process which impairs the spinning qualities of the yarn. Under the best conditions, cotton is injured more or less by the boiling and chemicals used in dyeing and the injury to the fibre is often increased by imperfect handling of the material in the dyehouse. Champlain.

Small bunches in yarn may be made by a worn out traveler with sharp edges which chafe the yarn as it passes to the bobbin. More or less sticky foreign matter will gather on the front roll, and the sliver will take it up. The top rolls should be kept clean with wood alcohol and water when spinning black yarn. Festus.

Run and Grain Systems.

Editor Textile World Record:

We wish to change our system of weighing yarns. We have been using the grain system based on 20 yards. We want to use the run system. What would 70 or 80 grain yarn equal by the run system?

Maryland (486).

The reduction of the 20-yard grain system is very simple.

Dividing 87 1/2 by the grains gives the runs.

Dividing 87 1/2 by the runs gives the grains.

Ex. Find the run equivalent of 70 grain yarn.—87.5 ÷ 70 = 1 1/4 runs.

Ex. Find the run equivalent of 80 grain yarn.—87.5 ÷ 80 = 1.09, or nearly 1 1/10 runs.

Ex. Find the run equivalent of 50 grain yarn.—87.5 ÷ 50 = 1 7/8 runs.

Ex. Find the grain equivalent of 2 run yarn.—87.5 ÷ 2 = 43 3/4 grains.

Ex. Find grain equivalent of 3 run yarn.—87.5 ÷ 3 = 29 2/10 grains.

Ex. Find the grain equivalent of 5 run yarn.—87.5 ÷ 5 = 17 1/2 grains.

The runs indicate the number of 1600-yard lengths in one pound. The various equivalents of this basis are as follows:

1600-yard lengths in one pound.
100-yard lengths in one ounce.
1-yard length in 4 3/8 grains.

The run system is very convenient for calculating the weight of yarn in ounces, because the runs indicate the number of hundred-yard lengths per ounce. Thus 1 1/4 runs measure 125 yards per ounce.

Ex. Find ounces of warp per yard of cloth made with 1440 ends of 1 1/4 run yarn.—1440 ÷ 125 = 11.5 ounces warp per yard.

Ex. Find ounces of filling per yard of cloth woven 80 inches wide with 28 picks of 2 run yarn.

80 × 28 = 2240 yards.

2240 ÷ 200 = 11.2 ounces filling per yard.

No allowance is here made for take-up in warp or slack in filling.

Rowy Goods.

Editor Textile World Record:

Enclosed is a piece of cloth which you will see is streaked in the filling. We have much trouble with rowiness in our dark mixes; the streaks vary in width. We are making the goods with a Fearnaught picker, English cards and Scotch feed on the second breaker, two laps on the condenser, and a single shuttle loom. What is the cause of the difficulty? Tres Bien (497).

The sample received is mixed cotton flannel, one-half being considerably darker than the other. We have analyzed the dark and the light half of the sample with the following results:

Dark Half.

Weight, 5.2 ounces per square yard.
Warp, 33 threads per inch single 20 1/2 cotton.
Filling, 34 threads per inch single 5.7 cotton.

Light Half.

Weight, 4.8 ounces per square yard.
Warp, 33 threads per inch single 20 1/2 cotton.
Filling, 37 threads per inch single 6.8 cotton.

These are the finished sets and sizes of the yarn. The sizes are indicated by the cotton system of 840 yards per pound, although the filling is made on the "woolen" system. The spun size and woven set of the cloth will, of course, be different from the finished set and size, but the latter will serve for comparing the two parts of the sample. It will be noticed that the weight, set and size of the warp yarn is the same in both cases. There is a wide difference in the filling, however, there being three more picks per inch in the light sample than in the dark one, and the yarn is 20 per cent. finer. This variation would unquestionably cause a variation in the shade of the cloth. Upon comparing the filling in the two samples, that in the light cloth is found to be considerably lighter in shade, indicating that the white stock is irregularly mixed in the batch.

Our analysis and comparison of the two parts of the cloth make us very confident that the variation is due to this irregular mixture of the colors and to the variation in the size of the yarn.

The machinery on which this yarn was made makes it very difficult to obtain a thorough and uniform mixture of colors. Neither the feed on the second breaker nor the two laps on the finisher give a sufficient amount of doubling. Furthermore, by the use of one shuttle on the loom the stock enters the cloth in practically the same order in which it is delivered from the breaker.

The remedy consists in mixing the stock very carefully and uniformly in the picking room and increasing the doubling on the card. The latter can be accomplished by using a creel on the second breaker. In picking black and white mixtures the white is apt to separate from the black stock as it flies from the picker. This can be remedied by care on the part of the picker man in collecting the white stock from the edges of the pile and running it again through the breaker, also by introducing a steam jet under the mouth of the breaker.

The difference in the size of the yarn is also an important factor contributing to the variation in shade. On such coarse sizes a difference of one in the count is equal to 20 per cent. The use of two or more shuttles on the loom would reduce the rowiness in the goods, but this expedient is merely a makeshift; the cause lies farther back and should be removed. The combination of automatic feeds on the second breaker and laps on the finisher with a single shuttle loom, make it extremely difficult to obtain goods free from rowiness.

Bleaching Cotton Goods.

Editor Textile World Record:

After bleaching our goods, and just before dyeing, we run them through a hot soap bath in order to soften them. We use a good five-cent soap, but we cannot get them soft. Please tell us if the soap is not good enough or if we should use more.

John Drum (495).

It would seem as if John Drum was putting the cart before the horse, for softeners should always be used after dyeing, never before. There are many things that contribute to the soft or harsh feel in goods. First the yarn, which may be spun hard or soft; the weave and method of bleaching will have some effect; also the color which the goods are dyed, and last, but not least, the dyestuffs used for certain colors will make the goods harsh.

To overcome this harsh feel, finishers use softeners made of cotton seed, palm, olive or other vegetable oils. These are added to the starches if the goods are sized, but when the goods are not sized, they are soaped with neutral white chip or olive soaps at 110 to 140 deg. F. The final feel of the goods—harsh or soft—is more in the finish than in the bleach, but everything contributes to the result—yarn, weave, dye and finish. Baumwolle.

Indian Cotton.

Editor Textile World Record:

Can you give us the names of firms importing Indian cotton into this country?

Fabricant (496).

A very small quantity of cotton is at present imported from India into the United States. During the cotton famine at the time of the Civil War, Indian cotton was imported to some extent, but since then its use here has entirely ceased. More or less of it is used in Europe, but the greater part of the cotton crop of India is consumed in the Indian mills.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

The knit goods situation has changed considerably since our last writing. The raw material markets have been on the move and while wool has become firmer every day, cotton has taken a decided slump and it is difficult to determine where it will end. This, of course, has its effect on the manufactured product.

The yarn market has not receded along with the raw cotton and while the future may and probably will show some decline, it will not be possible for the majority of manufacturers to figure very much of a reduction on their costs for the reason that they have already contracted for a large proportion of the yarn needed for the season's production. This is another example of the poor manufacturer, playing in a game against the buyer who says, "Heads I win and tails you lose."

Of the large number of manufacturers in the business, some exceptional ones are left in a position to take advantage of whatever decline in raw material may come and these are soon worked by the large buyers for quotations with which to hammer down the manufacturers who already have the orders, but who must now make lower prices to hold them, regardless of what his yarn cost. He has no such course open to him to work the people from whom he buys his supplies and thereby plays a losing game.

Owing to the change in raw material prices, a prominent manufacturer has reduced his price on ladies' 8-lb. peeler ribbed vests and pants from $2.15 to $2.00 and has increased the discount on his two lines of children's straight ribbed goods 2 1/2 per cent and now quotes $1.90 on 7-lb. boys' fleeces with covered seams and feather edge binding, and a line of misses' pants in sizes 24 to 34 at the same price.

On the standard fleeces, the opening price was $3.50, but after the salesmen had been in the storm centers of St. Louis and Chicago for a few days, $3.35, $3.37 1/2 and $3.40 were the figures and while such lines as Harrower, Union and Utica goods are still being held at $3.37 1/2, some very creditable goods made by the Wayside Knitting Co., MacKinnon and the Aken Knitting Co. are offered at $3.25 and also some 12-lb. goods for size 40 made by the Groat Knitting Co. are shown at $3.12 1/2.

The Capron Knitting Co. are showing some excellent values in low priced men's goods. They have a fleeced garment at $2.62 1/2 which, of course, is very light weight. They also have a very sightly line of men's tuck stitch ribbed goods with grosgrain silk front and double seated drawer at $3.00.

The Utica Knitting Co. are showing a line of higher grade fleeces similar to numbers produced by Wright ,and are marketing same through Barnes & McGoey at a small discount less than standard of prices asked by Wright. The styles are so similar that if it were not for the hangers, it would be difficult to distinguish by which manufacturer the goods were made.

The Avelon Knitwear Co. have increased the weight of their fine stitched, combed ribbed vests and pants to 8 1/2 lbs. at $3.50 in both peeler and white. They have also improved the cuff of their line by putting them on with more elastic stitch and have adopted the bulge front cut for their corset covers, and reports have it that they are well sold up for the season.

The heavy, fleeced ribbed line of ladies', men's and children's goods sold under the "Vellastic" brand met with large sale the season just past, and, although the manufacturers are asking the same prices this year, they claim to have booked a great many orders. Chances are that, owing to the limited competition on this class of goods, no new prices will be made, notwithstanding the low price of cotton.

On wool goods, although the material has

advanced from 10 per cent. to 25 per cent., the advance asked on manufactured goods is comparatively slight. Some few manufacturers claim to be selling their production at last year's figures, but those looked upon by the trade as the more reliable ones, are asking advances either in price or terms, or candidly admit that they are changing the batches.

A good business is being done on all lines of wool goods, and one important manufacturer has withdrawn his line from sale entirely, stating he has sold all the goods his four mills could produce in 1905, while we notice an independent feeling among others which indicates that they are well conditioned.

The Oneita line of combination suits is being shown at practically last year's prices, and a decided improvement has been made in the trimming of this line that adds much to its appearance.

A noticeable increased demand is being made for children's and boys' combination suits and some large orders have been placed on boys' suits in fleece lined and heavy fleece ribbed goods that reaches the consumer for a 50-cent garment.

We have heard considerable inquiry for a boys' better suit, something in a mixed ribbed garment that can be retailed at $1.00, and the manufacturer who gets out such a garment will find a ready sale for it.

HOSIERY.

Reports from travelers indicate an unsatisfactory condition of the hosiery market. Spring lines are well conditioned, but it will be necessary for the majority of travelers and selling agents to make another trip on heavy weights, owing to the cut prices made by some manufacturers during the latter part of December.

When it became possible for buyers to get 176 needle, 1 1/2-lb. ladies' hose with spliced heel and toe at 62 1/2 cents that have hitherto been considered big value at 65 cents, it began to look that everything was coming their way and as a consequence, the conditional orders placed the early part of the month were called off, and buyers now exhibit no hesitancy in asking for concessions down to the basis of 7-cent cotton. Several manufacturers have withdrawn their lines from sale until conditions become more settled. There are several lines of 176 needle, 2 1/2-lb. full seamless ribbed top fleeces selling below $1.00 and hem tops at 95 cents and under.

The cutting in prices is not confined alone to cotton goods, but is present in some lines of merino and worsted goods, particularly in 216 needle misses' hose, weighing 2 1/2 lbs. on size 9 which opened at $1.92 1/2, but has been reduced to $1.82 1/2 regular.

A line of boys' two and one rib goods have been reduced from $1.82 1/2 to $1.75.

In half hose, the sock weighing 2 lbs. for size 11, containing about 20 per cent. wool, has been cut from $1.10 regular to $1.00 net, and a blue mixed merino which opened at $1.85 is now quoted at $1.77 1/2, while black cashmeres have gone from $1.90 net to $1.85 regular. There are some manufacturers who have not met these cuts, but who have withdrawn their lines instead, and now state they will make no concessions from the higher prices mentioned above, but will certainly be asking advance prices on everything containing any percentage of wool very soon.

CIRCULAR LATCH NEEDLE MACHINES.

BY LAFAYETTE.

This article will have reference to that class of machines using latch needles and making the rib stitch only. Of this class of machines for making rib tops and legs for hosiery, and men's and ladies' ribbed underwear, there are several makers, as McMichael & Wildman, Scott & Williams, Stafford & Holt, Leighton, Brinton, Nye & Tredick, Pepper, Ruth, etc. There are two other makes of circular machines, Lasher and Cooper, which make the rib stitch, but they use spring bearded needles.

There are other latch needle circular machines which make only the plain stitch such as the Invincible, Hemphill, Mayo, Standard, Paxton & O'Neill, Excelsior, Branson, Boss, Victor, etc., all of which are used principally for the manufacture of hosiery.

There are also other machines using latch

needles which are not circular but flat. These flat machines will, however, make circular work, by operating first one side and then the other alternately, but they are not as rapid for circular work as the regular circular machines, therefore, the flat machines are used more especially for full fashioned work, such as underwear, mitts, gloves, sweaters, cardigan jackets, full fashioned union suits, and fancy stitches in ribbed work, etc., etc.

Latch needle circular machines require no special setting up, as they usually are all set up in the shops and partly adjusted before being sent out.

I will, therefore, describe more particularly the construction of one of these makes of machines, which will for all practical purposes apply to them all, and also give the adjustments for its proper working and the turning out of good work.

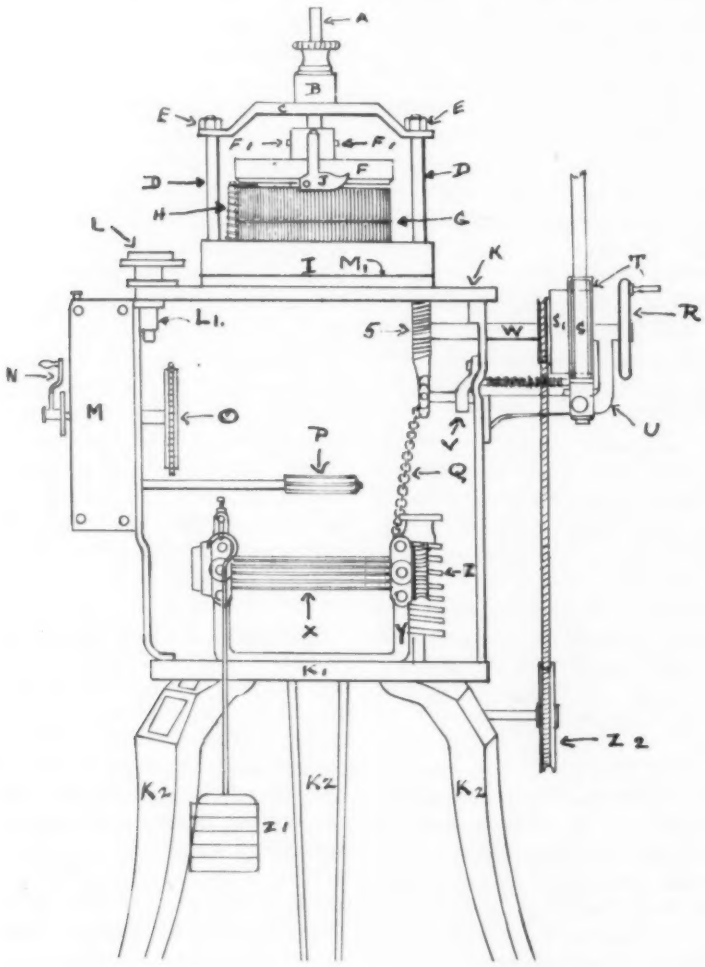


FIG. 1.

Fig. 1 is a full view of one of a latch needle machine.

Fig. 2 is a plan and Fig. 3 an elevation of the dial which is under the dial cap, F, Fig. 1, but is not shown there

A, Fig. 4, is the centre stud of the dial cap, F, Fig. 1, and of the dial Figs. 2 and 3.

Fig. 5 is a view of the collar which is fast-

ened to the end of stud, A, Fig. 4, directly under the end of dial, 4, Fig. 3. Upon this collar the dial, Fig. 3 rests, leaving the centre stud free to revolve in the hole 4, Fig. 2 and 3.

This centre stud A, Fig. 1, passes through the cross bar, C, and through the dial cap, F, and through the centre hole in dial, 4, Figs

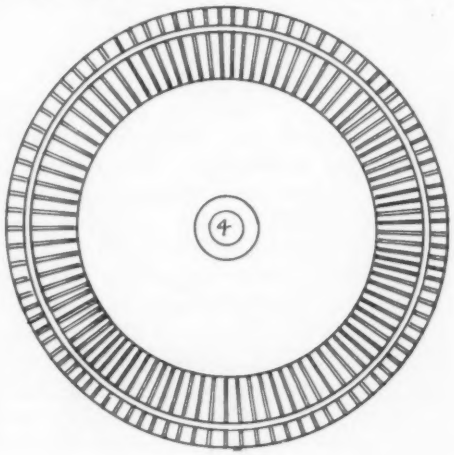


FIG. 2.

2 and 3. The end of the stud projects through the end of the hole, 4, Fig. 3 far enough to attach the collar, Fig. 5, to it.

The set screws, F—1, Fig. 1, secure the dial cap, F, to the centre stud, A. The top part of the centre stud is cut with a screw thread, B, Fig. 4, to which the adjusting nut,

FIG. 4.

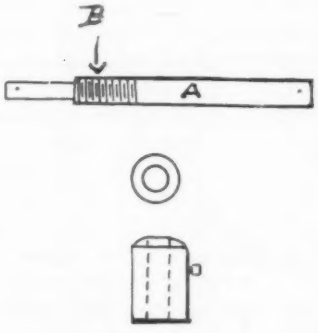


FIG. 5.

B, Fig. 1, is screwed. This adjusting nut, B, rests upon the cross bar, C, Fig. 1. The cross bar, C, thus supports the dial cap, F, with the dial. The adjusting nut, B, being for the purpose of raising and lowering the dial with the cap, either up or down to the needle cylinder, G.

C, Fig. 1 is the cross bar attached to the pillars, D, and fastened to these pillars by the nuts, E.

Fig. 6 is a plan of cam ring M 1, Fig. 1. The pillars, D, pass through the cam segments, I, and are screwed into the cam ring, M 1, Fig. 6.

The cam ring, M 1, to which the cam segments, I, are fastened by means of a screw,

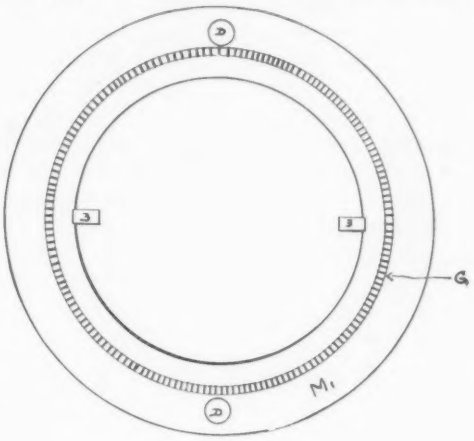


FIG. 6.

Fig. 7, B, at the top, has on its under side the bevel gearing, into which 5, Fig. 1, meshes. This bevel gear, 5, is attached to the driving shaft, W, to which the driving pully, S 1, is fastened.

The dial cap, F, being thus connected to cam segment, I, in the manner described, and these being connected with the driving pulley, S 1, it follows that when the cam segment, I, with the cam ring, M 1, revolves around the stationary needle cylinder, G, the dial cap, F, and yarn carrier, J, with cross bar, C, and pillars, D, centre stud, A, and nut, B, all revolve together, while cylinder, G, Fig. 8, and dial, Fig. 3, remain stationary.

Fig. 8 is an elevation of the needle cylinder, G, Fig. 1. Fig. 9 is a plan of same. 3, 3, Fig. 9, are two lugs on inside of needle cylinder, G. On the dial, Fig. 3, are also two lugs.

The dial, Fig. 3, being under dial cap, F,

as already described, the two lugs, 3, on dial come against the two lugs, 3, on needle cylinder, G, thus holding the dial stationary with the needle cylinder, G.

G, Fig. 1, is the needle cylinder into which grooves are cut so that the latch needle, Fig. 10, can work up and down freely. The hub, A, Fig. 10, of the needle is the part operated upon by the cams, as will be hereafter shown. It is fastened to the inner part of head, K, by four screws at equal distances around the bottom, or under part of cylinder.

Fig. 11 is the latch needle for the dial, Figs. 2 and 3, grooves being cut in this also so as to allow the needles to work in and out freely.

A shorter needle for the dial is necessary, as there is only the distance from the centre hole to the outside for them to work in.

H, Fig. 1, is a stop motion for the machine and is shown more clearly in Fig. 12. The bent part, H', at the top is set directly be-

FIG. 7.

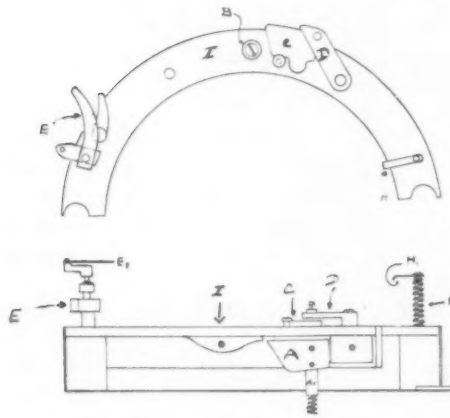
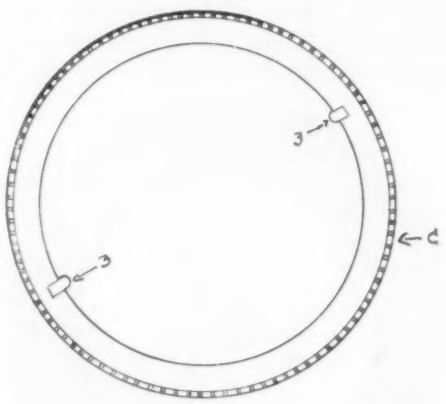


FIG. 12.

tween the cylinder and dial needles, and in case of the needles or latches getting bent, or the work loading up on the needles, it will be turned aside. On the lower end, H 2, of this stop motion is attached a little catch which is held in position by the spring as shown. When the stop motion, H, is turned to one side by a bent needle, the catch on the bottom projects outwards, and in revolving with the cam segment, I, comes in contact with another catch at the back part of the machine, not shown in Fig. 1, and the end of this catch in its turn is connected with a lever attached to V, Fig. 1, which holds the belt

FIG. 9.



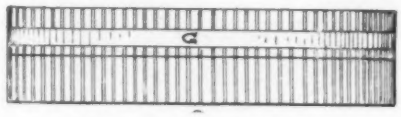


FIG. 8.

shipper, T, in place when on the driving pulley, S. As soon as this catch is released by the action of the catches connected to this

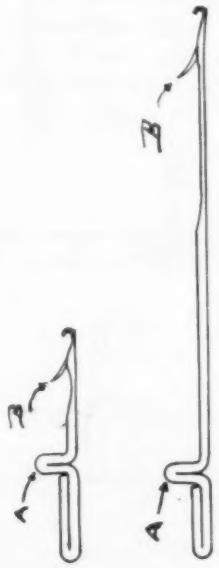


FIG. 11. FIG. 10.

stop motion, H, the spring as shown on belt shipper, T, throws the belt shipper with the

belt on the loose pulley, S, thus automatically stopping the machine whenever the stop motion, H, comes in contact with bent needles or other obstruction, thus preventing the machine from running and making bad work.

I, Fig. 1, is the cam segment, containing the cams for operating the needles downwards in the needle cylinder, G.

(To be continued.)

A KNITTED FABRIC.

Figs. 1 and 2 show the construction of a knit fabric recently patented in this country. It consists of a series of sections of knit fabric joined together by a connecting-thread, which may be readily detached therefrom by pulling one end of the same transversely of the sections of knitted fabric and when thus withdrawn from the sections of knitted fabric leaves the adjacent ends of said sections with smooth, neat edges. In practice the ribbed goods are knit in a series of sections, each two adjacent sections being joined together by a connecting thread, which is automatically knit into the fabric, joining two sections thereof, by improved mechanism which substitutes a connecting-thread for the regular thread and knits the same into the goods in such a manner that it may be easily withdrawn after the goods have been removed from the machine, and after the connecting-threads have been withdrawn a number of sections of fabric will be obtained, each having a smooth, neat edge at the opposite ends thereof, said sections of knitted material being ordinarily used for underclothing and the like.

The invention consists in sections of knitted fabric joined together by a detachable connecting-thread.

Referring to the drawings, Fig. 1 is an enlarged perspective view illustrating two sections of fabric joined together by the improved connecting-thread. Fig. 2 is a perspective view illustrating another form of the fabric in which two sections of knitted fabric are joined together by a connecting-thread.

In the drawings, 3 and 4, Fig. 1, are two sections of knitted fabric. 5 5 5 and 6 6 6 represent the final loops upon opposite faces, respectively, of the one-and-one rib-knitted fabric 3. 7 is a connecting-thread which extends laterally across said sections of knitted fabric from right to left, Fig. 1, passing through the final loops 5 5 and 6 6 of said fabric 3 alternately and forming one course of a one-and-one rib fabric, the loops 9 9 of said connecting-thread extending through the final loops 5 and the loops 8 8 of said connecting-thread extending through the final loops 6.

After arriving at the left-hand side of the fabric 3, Fig. 1, the connecting-thread 7 returns, forming one course or series of elongated loops 11 11, which extend through the loops 8 8, previously formed by said connecting-thread in passing from right to left of the fabric.

The fabric, 4, is formed by the yarn, 12, which is a continuation of the yarn forming the fabric, 3, as seen at the right of Fig. 1, and as said yarn passes across the fabric from

In Fig. 2 a connecting thread is shown joining together two one-and-one rib fabrics; the one-and-one rib fabric, 3′, is joined to the one-and-one fabric, 4′, by the connecting-thread, 7′ which in passing from right to left across the fabric forms a course of one-and-one rib fabric passing through the loops, 5′ 5′ and 6′ 6′, and forming loops, 9′ 8′, upon opposite faces, respectively, of the fabric, 3′. Upon its return from left to right the connecting-thread, 7′ forms a second course consisting of long loops, 11′ 11′, which extend through the loops, 8′ 8′, previously formed by said connecting-thread in passing from right to left of said fabric. The yarn, 12′, forming the fabric, 4′, is a continuation of the yarn forming the fabric, 3′, and passing from right to left of the fabric forms its first course primary loops, 13′ 13′, extending through the loops, 9′ 9′, of the connecting-thread, 7′, and upon returning from left to right the yarn, 12′, forms in its second course a one-and-one rib fabric with loops, 14′ 14′ and 15′ 15′, upon opposite faces, respectively, of the fabric, 4′.

It will be noted that the free ends, 16 and 17, of the connecting-thread, 7, and 16′ and 17′ of the connecting-thread 7′, terminate upon the same side of the fabric, and also it will be understood that while this illustrates the connecting-thread as applied to two sections of flat-rib fabric the same may be ap-

plied to two sections of a tubular rib fabric.

In removing the connecting-thread, 7, from the two sections of the knitted fabric which it joins together, the free end, 16, is first drawn toward the right, Fig. 1, and the loops, 11 11, are withdrawn one after the other from the loops, 8 8, from the right to the left hand side thread from one side to the other is practically straight and the loops, 13, are drawn by the loops, 9, up against the loops, 5. The connecting-thread being now straight from one side of the fabric to the other it is easily withdrawn by a continuation of the pull toward the left upon the splicing thread, thus

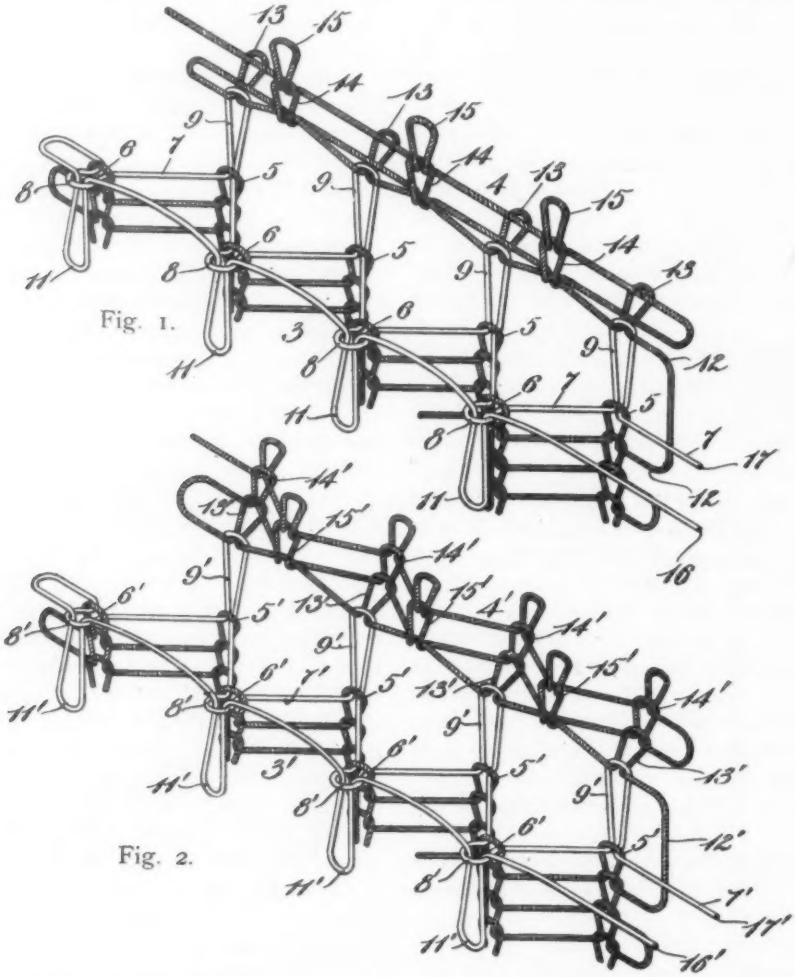


Fig. 1.

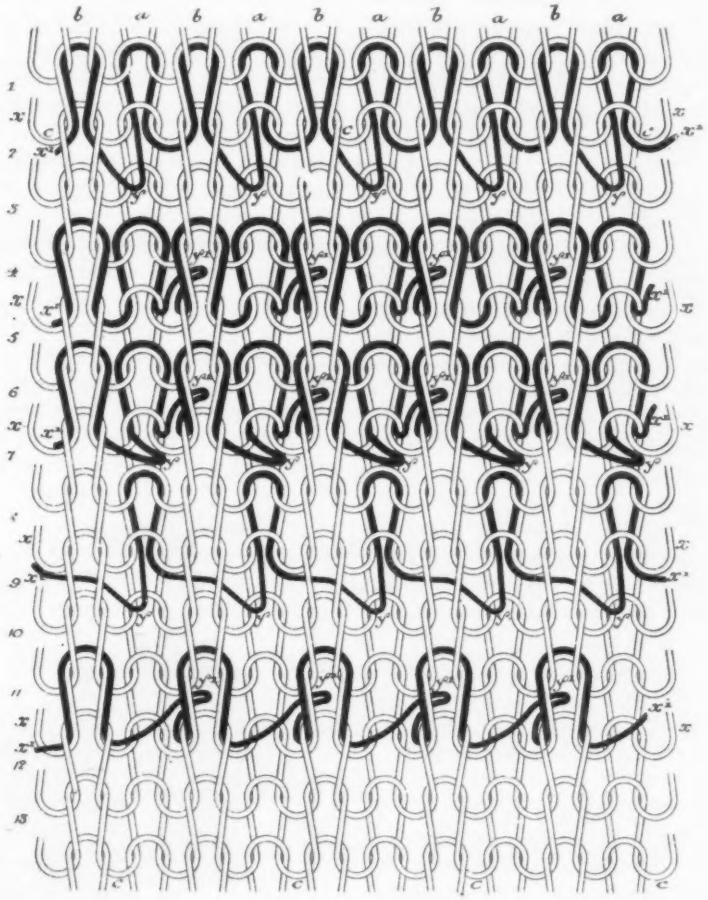
Fig. 2.

of the fabric. The free end, 16, is then passed over to the left hand side of the fabric, Fig. 1, and drawn toward the left, thus pulling the loops, 8 8, through the loops, 6 6, until all the loops are withdrawn from the right to the left of the fabric. Upon continuing to pull upon the free end, 16, toward the left, Fig. 1, the loops, 9, are drawn up against the under side of the loops, 5, until the connecting-entirely disconnecting the fabric, 3, from the fabric, 4, the loops, 13, forming the primary loops of the fabric, 4, and the loops, 5 and 6, forming the final loops of the fabric, 3.

The operation of removing the connecting-thread, 7', which connects the fabrics, 3' and 4', is substantially the same as described for removing the connecting-thread, 7, which connects the fabrics, 3 and 4.

A RIBBED KNITTED FABRIC.

The knitted cloth shown at Fig. 1 has recently been patented in this country and, as stated by the inventors, consists of a fabric having a pile surface that can be fleeced, the loops being formed by one of the strands of loop between the front and back wales of the fabric, so that it could not be acted upon by the brush used to form the fleece. In the new fabric one or more of the strands of the composite knitting yarn is projected between the wales of that face of the fabric selected for the pile surface, so as to form loops ex-



A RIBBED KNITTED FABRIC.

a composite yarn, and not by a supplementary thread.

When in knitting a plain fabric an elongated loop is cast off of a heddle of the machine, together with the loop of ordinary length, both of the loops will be thrown to the back of the fabric; but in knitting a ribbed fabric the simple elongation of the loop of one strand of the composite knitting yarn would result in the casting of the elongated tending beyond the wales, enabling them to be brushed without injury to the body of the fabric.

A machine is used having loopers or sinkers so arranged that they can act upon one of the strands of the composite knitting yarn without acting upon the other strand or strands of the same.

In the drawing the figures 1, 2, 3, 4 etc., represent successive courses of the fabric

(a) and (b) represent adjoining needle- wales, and (c) the sinker wales, the stitches in the needle-wales (a) being drawn in one direction or to one face of the fabric, the stitches in the needle-wales (b) being drawn in the opposite direction or to the other face of the fabric, and the yarn in the sinker wales extending from the wales of one face of the fabric to those of the other face, as is usual in ribbed knitted fabric.

The knitting-yarn employed, however, is a composite yarn having in the fabric shown in Figure 1 two strands, x and x′, these strands being controlled by independent yarn-guides or one guide with two feed-holes, so that one strand can be acted upon independently of the other. In course, 1, of the fabric the strand, x′, is projected from the composite yarn where the same forms sinker-wales, c, so as to form loops, y, which project outwardly beyond the wales, b, in order that they can be readily brushed without injury to the knitting-yarn constituting the said wales, these loops being formed by applying the strand, x′, of the knitting-yarn to a projecting looper or sinker in its course from the needle which produces the wale, b, to the needle which produces the wale, a.

In course 4, the strand, x′, of the knitting-yarn is projected so as to form loops, y′, on the opposite face of the fabric from that on which the loops, y, are formed, the operation being the same except that the loopers or sinkers draw the loop in the opposite direction from those which formed the loops, y.

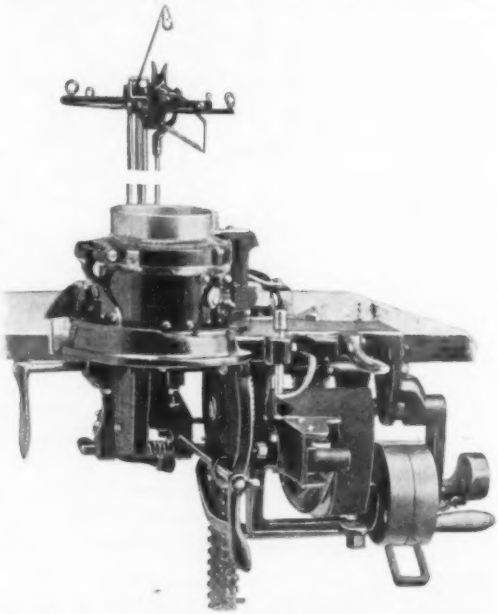
In course 6, is illustrated the formation of loops on both faces of the fabric, and in course 8, is shown the loops, y, as being formed from the strand, x′, of the knitting-yarn; but this strand does not form stitches in the wales, b, of the fabric, the yarn-guides in this case being so arranged that the guide which controls the strand, x, will feed the same to both sets of needles; but the guide which controls the strand, x′, will feed the same only to the needles which produce the wales, a, and to the sinkers or loopers, this strand passing behind or out of the path of the other set of needles, which produced the wales, b.

In course 11, are shown the strand, x′, of the knitting yarn as forming loops, y′, without forming stitches in the wales, a, of the fabric. The yarn-guide controlling strand, x′, in this case feeds said yarn to the needles which form the wales, b, and to the sinkers or loopers, but lays said strand, x′, behind or out of the path of the needles which form the wales, a.

A composite knitting-yarn otherwise disposed, as in courses 8 or 11, may be caused to form loops on both faces of the fabric by subjecting its strand, x′, to the action of loopers disposed in every one of the spaces between the needles instead of only in every other space.

THE BOSS KNITTING MACHINE FOR HOSIERY.

Hosiery manufacturers will be interested in a description of the new 15/16 automatic knitting machine shown in the accompanying illustration and built by the Boss Knitting



Machine Works, Elm and Reed Streets, Reading, Pa., who offer it to the trade as a substitute for the full automatic machine. It makes but two stops in knitting a stocking, breaks out the extra splicing yarn in the heel and toe, and changes from reciprocating to

circular work, all automatically. One operator can run four machines on half hose and from 12 to 18 on ladies' hose. The production is from six to ten dozen on half hose and three to five dozen of ladies' hose per day according to the gauge.

The builders say the cylinder can be transferred as easily as on any other machine for half or ribbed hose. The machine is well built to stand hard service and the very few parts are all interchangeable. From 84 to 220 needles can be used in the same machine and the cylinders changed in a very few minutes. The machine can be run at a very high speed and is so simple in operation that an inexperienced hand can learn to run it in a very short time. The size of the heel and toe can be varied as desired. Among the other advantages claimed for the Boss machine are reduced needle breakage, low cost of repairs, an improved web holder and absence of dropped stitches. Only one chain is used for widening, narrowing, measuring and stopping the machine and no weights at all are required. The machine is built in sizes varying by quarter inches from 2 1/4 to 5 1/2 inches.

In addition to this knitting machine the Boss Knitting Machine Works build loopers, steam hosiery presses, forged steel cylinders and are equipped to make repairs at short notice. They also build all kinds of light machinery to order.

AN IMPROVEMENT IN A CLOTH CUTTING MACHINE.

The Eastman Machine Company, Buffalo, N. Y., maker of the Eastman cloth cutting machine, has effected many improvements on it, for which patents have been applied for. Previously the field coverings were made of cord. This has been supplanted by nickel, which not only improves the looks of the machine but makes it more practical. The base or plate which has heretofore been set on ordinary rollers has been fitted with a ball-bearing roller plate, which gives the machine a much easier and freer motion. The connecting rod has been made ball bearing, a feature which reduces both wear and noise. The front and rear bearings are now ball bearing, thus reducing the friction and increasing the speed of the machine from 300 to 400 revolutions, the speed of the machine now being about 2,300 revolutions a minute. Another big improvement in the machine is the placing of light directly in front of the cutting knife, thus throwing its rays in front and on both sides of the presser's foot—a decided advantage to the cutter. In the new location the lamp is also exposed to less vibration, which prolongs its life.

Finding the Count of Yarn.

Editor Textile World Record:

How can I determine the count of yarn in a sample of knit goods? Worsted (493.)

The simplest way to determine the count of yarn in a sample of knit goods is to ravel, measure and weigh twelve yards of the yarn. The cotton count is then found by dividing 100 by the weight in grains. That is, if 12 yards weigh 5 grains the cotton count is (100 ÷ 5) 20. The worsted count is found by dividing 150 by the weight in grains. In this case the worsted count would be (150 ÷ 5) 30

Recent Knitting Patents.

KNITTING MACHINE Needle Picking Device. 774,124. Louis N. D. Williams, Ashbourne, Pa., assignor of one-half to Robert W. Scott, Philadelphia, Pa.

KNITTING MACHINE, Straight Bar. 774,299. Alban Woller, Hormersdorf, Germany.

KNITTING MACHINE Take-Up Mechanism. 774,755. Leon C. Huse, Laconia, N. H., assignor of two-thirds to Warren D. and Walter L. Huse, Laconia, N. H.

KNITTING MACHINE. 774,464. William T. Barratt, Bennington, Vt., and Charles J. Sibbald, Troy, N. Y., assignors to Charles Cooper, Bennington, Vt.

KNITTING MACHINE, Circular. 774,473. Harry A. Houseman, Philadelphia, Pa., assignor to Standard Machine Co., Philadelphia, Pa.

KNITTING MACHINE Cloth Wheel. 774,413. Albert A. Bailley, Cohoes, N. Y., assignor to Tompkins Bros., Troy, N. Y.

KNITTED FABRIC. Ribbed. 776,048. Robert W. Scott, Philadelphia, Pa., assignor of one-half to Louis N. D. Williams, Ashbourne, Pa.

KNITTING MACHINE Cam Device. Lamb. 775,742. Wilhelm Bach, Apolda, Germany.

KNITTING MACHINE Stop Motion. 776,445. Frank Wilcomb, Norristown, Pa., assignor to H. C. Coleman, Norristown, Pa.

KNITTING MILL NEWS.

New Mills.

Georgia, Fairburn. The Fairburn Hosiery Mills, recently reported incorporated with capital stock of $25,000, have started operations. S. L. Roan is president of the company; B. S. Roan, treasurer and C. A. Ricks, superintendent. They manufacture misses' and children's ribbed hose, operating 30 knitting machines and 5 loopers, using steam power. Goods are sold direct.

Illinois, Grant Park. E. A. Curtis is looking up the question of a knitting plan and is desirous of securing information regarding machinery, etc. He does not yet know what class of goods will be made.

New Hampshire, Tilton. It is reported that preparations are being made to equip the Copp factory with machinery for manufacturing hosiery.

New Jersey, Jersey City. Mr. Hermann Katz is operating a plant at 44 Coles Street. The plant is equipped with 5 (Grosser) knitting machines and 3 sewing machines. The plant is to be enlarged early in the new year.

New York, Brooklyn. The Lion Sweater Mills, L. Oboler, proprietor, is a new plant started at 155 Stagg Street. High grade sweaters are made, of cotton, wool and worsted. Equipment comprises two hand looms and one sewing machine.

New York, Cohoes. Albert Whitehouse, formerly with the Star Knitting Mill Co., has leased space in the Anchor Hosiery Knitting Mill and will start plant for making gloves.

New York, New York. The Domestic Knitting Mill Co. is a new concern recently started by Greenberg Bros. & Frankel at 36 East Broadway. They manufacture high grade ladies' blouses, and men's and boys' sweaters, plain and fancy. Have an equipment of 6 (Grosser) knitting machines and 3 special sewing machines. Goods are sold direct. They buy worsted and wool yarns. Are to instal additional machinery.

*North Carolina, Winston-Salem. W. L. Siewers is president and treasurer of the Wachovia Knitting Mills recently reported incorporated with capital stock of $50,000. L. B. Brickenstein is vice-president and W. J. Hege, secretary of the company. They will make ladies' cotton underwear and expect to start operations about February 1st. with 15 knitting and 12 sewing machines. Goods will be sold direct and through W. H. Burgess & Co., New York. A dye house will be attached to the plant.

Pennsylvania, Gouglersville. William Worley and John Geiger are reported to build a hosiery mill at this place.

Pennsylvania, Hawley. A new mill has been started here by Sands & Holden, manufacturing sweaters.

Enlargements and Improvements.

Connecticut. Poquonock. The Health Underwear Company has purchased some of the New Britain Knitting Company's machinery, recently sold at auction, and installed same in their mill.

Connecticut. Waterville. The Welch Hosiery Company is putting in new knitting machines.

*Connecticut, Winsted. The brick addition, 25 by 30 feet, three stories, to the Winsted Hosiery Mill, will be for additional storage capacity.

Georgia. Penfield. The Penfield Hosiery Mills, operating 102 knitters on 136 and 176-needle half hose, are about to make some important changes in their plant. The proprietor, Mr. E. R. Boswell, is now in the North for the purpose of purchasing new machinery for the knitting department as well as for a dye house, which they are about to put up and equip with the latest improved machinery for dyeing fast black and colors on hosiery, with a capacity of about 500 dozen per day. The production of the mill is sold direct.

Pennsylvania. Philadelphia. The Achuff Knitting Mills are about to apply for incorporation papers, with the old name to be used, the capital being $20,000, and Samuel Achuff and his two sons as the incorporators and officers of the company. The equipment of the plant is to be doubled, the 24 machines now being used to be thrown out and about 50 new machines substituted. They manufacture all kinds of children's cotton Derby ribbed underwear, the establishment being located at Kensington avenue and Huntingdon street, the goods being sold through New York.

Pennsylvania. Philadelphia. The firm of Rumpf & Scheer, at Coral and Firth streets, has been reorganized, Messrs. W. Rumpf and William C. Scheer being the active members of the firm. Mr. Rumpf states that they have recently ordered seven new flat machines from abroad and expect them to arrive in this country in about two months. These machines, it is said, are to be placed in a new addition, consisting of another story, to be added to the building which they occupy. In the event of the work not being finished in time to receive the machinery, they will be put up and operated in the factory of Frederick Rumpf's Sons at Eden, Pa. They manufacture full fashioned hosiery on 19 machines which is sold through New York.

*New York, Arcade. The Fashion Knitting Company has been incorporated by Messrs. A. G. Velasko and C. E. Crouse, to operate the plant formerly run by the Fashion Knitting Mill Co. They will manufacture women's and children's underwear and will start operations in December. Plant will have equipment of 70 knitting and 100 sewing machiens. A dye house is attached to the mill. Goods will be sold direct.

*New York, Cohoes. We have been advised by A. I. Whitehouse, that after settling up the affairs of the Star Mill, he will organize a company to operate same, manufacturing novelties in knit fabrics and wool ribbed underwear.

*Ontario, Toronto Junction. Operations have been started in the Crown Knitting Company's new plant. This is the plant in which Peter Ryan is interested.

Pennsylvania. Philadelphia. Messrs. E. Noon & Son's knitting factory at 4019 Germantown avenue, which has been shut down for some time, is again in operation. They are now working on samples of their bathing suits and striped underwear for the coming season which they dye and finish in the mill. They operate 30 knitters and 25 sewing machines, selling the goods direct.

Facts and Gossip.

California, Petaluma. It is reported that a knitting plant may be located here.

New York, Brooklyn. The Co-operative Knitting Works, Rubinstein Bros., proprietors, have changed their name from the above to the Progressive Knitting Works. They manufacture sweaters of all kinds, golf vests and knit goods.

New York, New York. The Worcester Knitting Mills have been incorporated under New York laws with capital stock of $200,000. William Hurd, Milbury, Mass., Frederick H. Dennis, Newton, and Francis F. McIver, New York, are interested.

New York, New York. The Yale Knitting Mill, formerly at 96 Throop Avenue, Brooklyn, has removed the plant to 178 Centre Street, New York City.

Ohio, Cleveland. The Standard Knitting Co., manufacturers of women's and misses' worsted shawls, sweaters, toques, skirts, etc., are very busy. In addition to the 20 latch needle machines which they are now running they have ordered several new machines of the full automatic pattern from the Grosser Machine Co., through Mr. Max Nydegger, Wool Exchange Bldg., New York. These machines are to be delivered in February, at which time they will be put to work on a new line of sweaters and blouses.

Pennsylvania, Philadelphia. The Melbourne Knitting Mills have recently been incorporated with a capital stock of $25,000. The incorporators are H. E. Ashmore, Edith B. Ashmore, John C. Wilson and Robert S. Bright. On January 1st this company will succeed the American Knitting Machine Co. in active business. The Melbourne Knitting Mills will not push the sale of the knitting machines formerly built by the American Knitting Machine Co., but will build machines on order for those who may desire them and will continue to supply parts and needles to all mills operating the Victor machine. H. E. Ashmore, general manager of the former company, will be president and treasurer of the new company, and W. P. Young superintendent. In a previous issue details of the new knitting plant established by the American Knitting Machine Co. have been given, and this business will be carried on by the new Melbourne Knitting Mills.

Pennsylvania, Philadelphia. W. G. Ellis & Co., manufacturers of men's, women's and misses' cotton, woolen and worsted seamless hosiery, at 415 to 419 Vine St., where they operate 300 machines, have applied for a charter under the name of the W. Godey Ellis Company, with W. Godey Ellis, Andrew C. Ayres, and Augustus M. Slack, the present superintendent of the establishment, as incorporators. The company will have a capital of $100,000 and continue the business of W. G. Ellis & Co.

Pennsylvania, Philadelphia. William Rowbottom, proprietor of the Economy Hosiery Mills, 1845-47 Hazzard St., reports that he has been very active running his 38 machines on cut feet, but expects to start on his regular line of plain hosiery about January 1st at which time he expects to do a rushing business. He sells his production through agents and direct.

*Pennsylvania, Columbia. A. R. Kreider & Bro., recently reported as having purchased the Gem Knitting Mills, will continue running the plant here and also the one at Annville. The Columbia plant, which is equipped with 53 knitting and 11 sewing machines, will be operated on men's cotton half hose.

Pennsylvania, Hawley. The United States Knitting Mills, who are very busy, have decided to increase their capacity and have ordered two new Jacquard Noppen machines, full automatic and run by power, manufactured by the Grosser Machine Co. The machines are expected to be delivered and in operation during the month of January. This firm manufacture cotton, wool, worsted and silk sweaters, toques, jackets, etc., on 36 machines, selling the goods direct.

Pennsylvania, Philadelphia. Messrs. Miller & Sons, 3839 Reno St., are very busy operating their machines on women's plain and fancy hosiery which they sell direct. Since the first of last year, when they were operating 16 machines, they have added 24 additional ones and have now placed an order for 10 more, bringing their equipment up to 50 in all. 16s to 80s cotton yarn is used in their operations, Chas. R. Miller being the superintendent and Jos. B. Miller the buyer. They do their own dyeing and finishing, having recently installed a plant for that purpose.

Pennsylvania, Philadelphia. Messrs. Stearns & Castor, architects in the Stephen Girard Building, have prepared plans for the erection of a one-story brick storehouse 45.11 by 111.7 1/2 feet at Franklin and Somerset Sts. for John Blood & Co., manufacturers of seamless and cut hosiery, 750 knitters. The architects announce that bids will be due on the 19th inst.

Wisconsin, Milwaukee. The Imperial Knitting Company, reported incorporated with capital stock of $50,000, and which purchased the plant of A. H. Dennhardt and enlarged and remodelled same, operates 30 knitting and 12 sewing machines, on men's, women's and children's sweaters, cardigan jackets, etc.

Personals.

John Michaels has accepted the position of boss carder for the J. L. & T. D. Peck Mfg. Co., Pittsfield, Mass.

George B. Griffin, paymaster of the Victor Knitting Mills Co., Cohoes, N. Y., has resigned and associated himself with E. B. Laughlin, manufacturer and supply agent for the underwear trade.

William Fitzgerald, boss rib knitter for D. M. Collins & Co., Pittsfield, Mass., who has been in their employ for about 18 years, was recently promoted to the position of superintendent.

E. L. Holland has resigned as superintendent of the Corona Knitting Mills, Anderson, S. C.

George B. Stover, after a service of over eighteen years with the present Montgomery Knitting Mill, is to retire from the position of superintendent for the Van Brocklin & Stover Co. His successor is Frank Van Brocklin, son of William S. Van Brocklin.

B. Zimmerman, assistant superintendent of the Oneita Knitting Mills, Utica, N. Y., has resigned.

Messrs. Winship, Boit & Co. (Harvard Knitting Mills), Wakefield, Mass., have placed a repeat order for humidifiers with the American Moistening Company, Boston, Mass.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

Cloth Cutting Machine. The Eastman Machine Co., Buffalo, N. Y., have recently made improvements in their cloth cutting machine, which are noted in another part of this issue.

Centrifugal Dyeing Machine. A. Klipstein & Co., New York City, are introducing to the trade the Cohnen centrifugal dyeing machine, developed in Germany, for which they are the American agents. A description appears in another part of this issue. The machine can be seen in operation at the Providence branch, 13 Matthewson St.

Silk Yarn Measuring Machine. J. P. Cronin, Paterson, N. J. A machine for measuring small lots of organzine from the skein or spool in lengths required for a given order. Such, for example, as four ribbon warp 500 ends 420 yards in length. The spools are filled with the required length so that when the warps are made the spools are empty, thus saving much waste unavoidable by the old method.

Non-Freezing Fire Extinguisher. The Franklin H. Kalbfleisch Co., New York City, has recently placed on the market a fire extinguishing solution which it is claimed, will not freeze even at a very low temperature. It is referred to in another part of this issue.

Vertical Engine. American Blower Co., Detroit, Mich., have recently placed on the market a vertical engine, which is described in another part of this issue.

Starch Preparation. The Arabol Mfg. Co., New York City, has recently placed on the market a prepared starch for sizing, called the International Prize Starch.

Warp Stop Motion. David Sowden & Son, Shipley, England, have recently brought out a warp stop motion which has given very good results in the English mills where it has been tested.

Flyer. Robert Schroter, Riga, Russia, is placing on the market an improved flyer for spinning frames, which is claimed to be capable of doing more and better work than previous forms of this device.

Yarn Printing Machine. Otto Hallensleben, Lucerne, Switzerland. A machine for printing, steaming and washing warp yarn.

Fancy Yarn Twister. Leon Valencon, Hodimont-Verviers, Belgium. An attachment for making fancy yarn. The ground thread runs continuously through vibrating aprons similar to those used on the condenser of a woolen card. The strand of colored roving is run intermittently between the same aprons and thus combined at intervals with the ground thread.

Yarn Twister. Joh. J. Rieter & Co., Winterthur, Germany, have recently brought out a yarn twister of a new model embodying many improvements.

Ring Frame Bobbin. John Dixon & Sons, Steeton, England. A conditioning bobbin in which the middle ring is inserted around the small bore of the bobbin. This ring isolates the inner from the outer portion of the wood and prevents the opening in the inner portion from becoming injured. It is said that when it is once inserted the ring cannot become loose or be removed by ordinary usage.

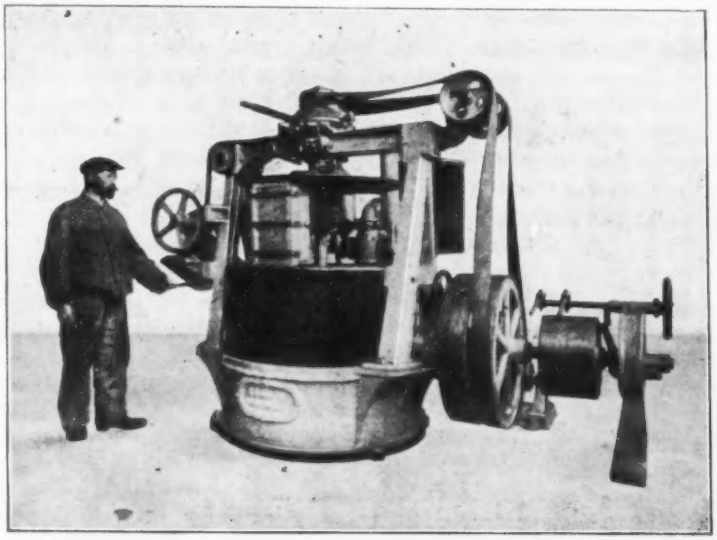
Cloth Brush. Robert Hall & Sons, Bury, England, are placing on the market a cloth brushing machine equipped with an emery cylinder. Various improvements have been embodied which, it is claimed, place the machine far in advance of any similar machine heretofore placed on the market.

Attachment for Ring Frame. S. Schwenzke, Leipzig, Germany. An attachment for ring spinning frames to prevent coarse threads and bunches from passing to the bobbin.

THE COHNEN CENTRIFUGAL DYEING MACHINE.

Nearly two years ago we published a description of the Cohnen centrifugal dyeing machine which had been invented and developed in Germany. Since then it has been introduced into many German mills where it is now in successful operation. Recently A. Klipstein & Co., 122 Pearl St., New York City, secured the American agency for this machine. It is a novel combination of a dyeing machine and a hydro-extractor and consists of a cylinder inside of which is a revolving drum. In this drum are fitted a series of metal boxes in which the material to be dyed has been packed with allowance for the shrinkage which results from the wetting. This package prevents pressure and insures uniform results. The interior centrifugal drum is then connected with a rotary pump by which the dye liquor is forced through the material at a rate of 600 gallons per minute until the dyeing process is complete. The pump is then detached and the power applied to the centrifugal drum to turn it as an ordinary centrifugal extractor, except that no air is admitted. Check valves in the rim of the drum allow for the exit of the liquor and prevent the entrance of air so that when the liquor is removed the material is in a vacuum. This prevents any premature oxidation. The power is then disconnected and a current of air is forced by a fan into the drum and through the dyed material until complete and uniform oxidation has been effected. After oxidation the drum is again connected with the pump and water forced through the dyed stock until all the loose material is removed.

A proof of the efficiency of the Cohnen machine is found in the fact that the first rinsing water to come from the drum is practically colorless, showing that but little dyestuff is lost through defective oxidation. After washing the pump is disconnected and power applied and the stock thoroughly extracted for the dry room. The changes occupy but a very short time and while one batch is being dyed an extra set of boxes is packed ready to insert in the machine as soon as those in use are removed. The time occupied in changing boxes is estimated at six minutes.



THE COHNEN CENTRIFUGAL DYEING MACHINE.

It is suited for loose stock, top, slubbing and yarn, and two of the samples in the January Dyer's Supplement are dyed on this machine. The advantages claimed for it are summarized as follows:

1. Scientific packing to insure uniform dyeing.

2. Thorough oxidation due to the preliminary vacuum and the succeeding air blast.

3. Delivery of the dyed material ready for dyeing without further handling.

4. Economy of time and labor.

5. Uniform and thorough dyeing.

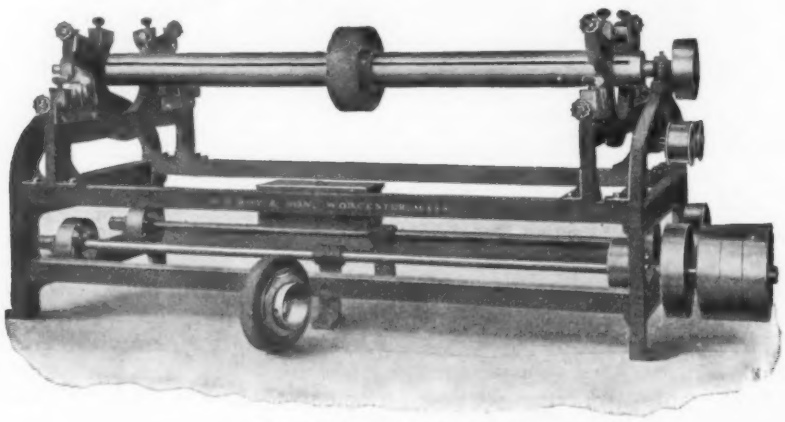
One man can run the machine and at the end of the operation both the machine and the stock are cold and in condition for easy handling.

The Cohnen machine is especially recommended for colors that require oxidation. It is said a little over an hour is required for dyeing the sulphur colors, so that seven batches can be colored in ten hours. Direct colors can be dyed in thirty minutes, this time including that occupied in changing boxes. The difficulties usually met in dyeing sulphur colors make the Cohnen centrifugal machine of especial value to cotton dyers. These difficulties include bronziness, streaks and harshness of the material, all due to the irregular oxidation of the dye on the fibre.

A. Klipstein & Co., 122 Pearl St., New York, the American agents, are prepared to demonstrate the merits of this machine to manufacturers at their Providence office, 13 Matthewson St., where one of the Cohnen dyeing machines is in operation.

THE NEW ROY GRINDER FOR NAPPER ROLLS.

Good work in napping fabrics depends not only on having the right fabric and the right napping machine, but also on keeping the machine in good order, the latter condition depending mainly on having the different parts of the machine carefully adjusted and the clothing well ground. The old way of trying to grind napper rolls by running them together is becoming obsolete. They are now run together only to burnish them after being ground with a traverse grinder. The traverse grinder should be fitted with two wheels, one an iron wheel covered with emery for surface grinding, and the other wheel composed of a number of emery discs, usually from ten to sixteen in number, for side grinding. The frame in which the grinder runs should be very heavy and rigid and made with bearings for holding the rolls, which are not only adjustable to the traverse grinder but adjustable to shafts of different diameters.



THE ROY NAPPER ROLL GRINDER.

To meet these requirements B. S. Roy & Son, Worcester, Mass., have built the machine shown in the accompanying illustration. It is so constructed that while two rolls are being surface or side ground in the two upper bearings, four more rolls, which have already been surface and side ground are run "back to back" to burnish them, six

rolls being thus in process of grinding at the same time. This firm also builds a napper grinder without the burnishing attachments to grind two rolls at the same time where it is not desired to burnish them after being ground.

As napper rolls are very wide it is necessary to have a true and very rigid grinder. The builders of the Roy 5-inch steel shell traverse grinder have aimed to make it the most rigid traverse grinder made, it having, it is claimed, a larger diameter shell than any other type of traverse grinder. The machine shown herewith has one of these 5-inch steel shell grinders, fitted with patent differential motion for giving the grinding wheel a steady, positive traverse. The cross heads, upon which are the bearings for the napper rolls, are adjustable for any width of less than the full width of the machine. In this way rolls of different widths can be ground on one machine.

The grinder is in use in many of our best mills, to which the builders will refer any one interested in the machine. The firm of B. S. Roy & Son is so well known to the textile trade as builders of card grinders that the name Roy is for this new napper grinder a guarantee of merit.

IT STOOD THE SHOCK.

It is hardly customary to design hot blast apparatus to withstand the shock of explosion, but the substantial character of such an apparatus built by the B. F. Sturtevant Co., for the Fabrikoid Co., of Newburgh, N. Y., is clearly evidenced by the accompanying

reproduction of a photograph taken shortly after an explosion of 1500 pounds of gun cotton within the building containing the apparatus.

The building was of wood and practically air tight, which made the force of the explosion greater. What is shown in the picture is all that was left. The fan and heater were intact, except that one name plate was blown off the fan; otherwise it was in perfect condition. The wheel turned with ease and ran as true as if it had just been set up. The steam connection to the heater was not harmed, although the asbestos covering on the pipe was blown off. The fan is running today just as if nothing had happened.

A NEW VERTICAL ENGINE.

The illustrations presented herewith show a vertical engine recently placed upon the market by The American Blower Co., De-

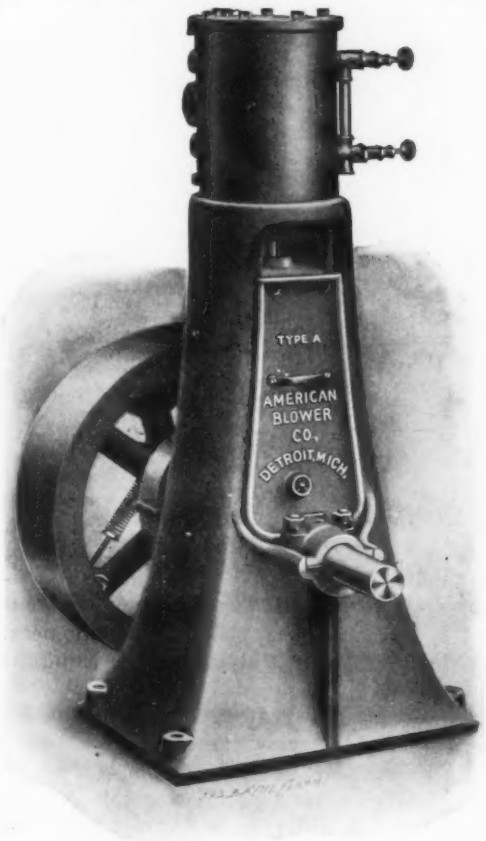


FIG. 1.

troit, Mich., which possesses unique features of great merit. From Fig. 1 it will be seen

that the engine has easy curves and graceful lines, giving it a handsome appearance. It is fully enclosed, preventing foreign matter getting into the working parts, yet the latter are easily accessible upon the removal of the enclosing plates by simply turning a milled hand nut and lifting out.

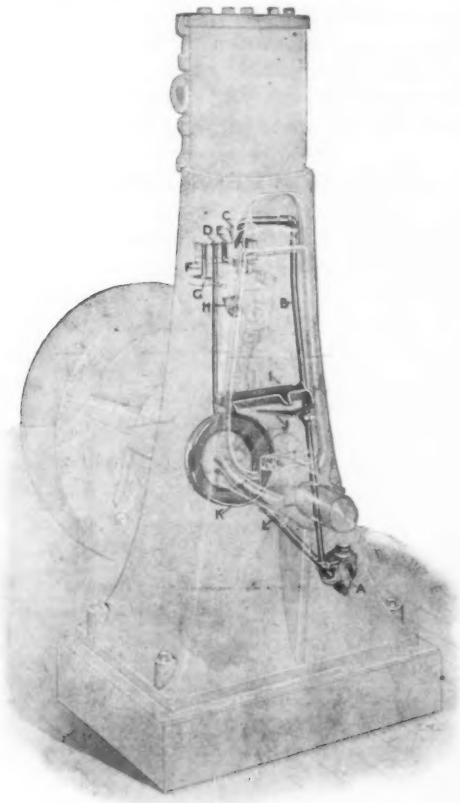


FIG. 2.

The leading feature of the engine is its oiling system. Automatic lubrication of engines has been very slow in development. Up to the present time it has been confined almost entirely to the splash system, which is seldom thoroughly effective, especially for vertical double reciprocating engines.

Such attention as this detail has received has been given to large horizontal engines, which are less likely to prove annoying through defective lubrication than are the small, high speed, vertical engines.

The system embodied in this engine is something entirely different from any of the usual methods, and has proven successful far beyond the most sanguine expectations of its designers. Every frictional surface is running on oil, there being no positive contact between metals, with the effect of almost eliminating wear.

The oiling is done by the engine itself, and instead of a drop or two a minute each bearing has a stream of oil. By referring to Fig. 2 the operation can be easily traced. An eccentric, K, on the shaft actuates the plunger, L, of the oil pump, A, forcing the oil up through the tube, B, into the small strainer, C. From C it drops into an oil box through the bottom of which four tubes project. In one side of each of these tubes there is a slot, so that when the oil box contains only a small amount of oil, each tube can take only its proper proportion. In case the box is full all the tubes get more oil in proportion to the increased height.

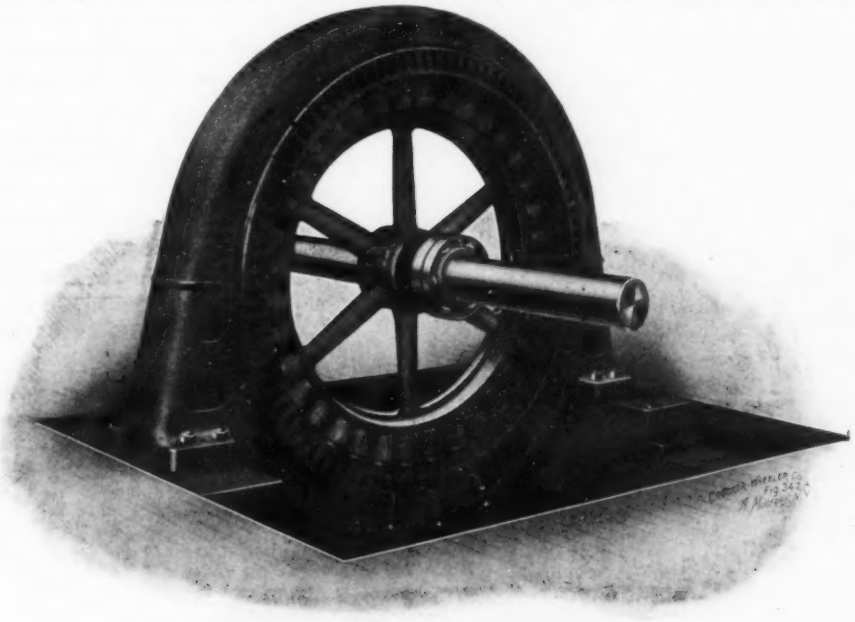
One of these tubes, F, and one on the opposite side, not lettered, apply oil to the guides, the oil dropping into a small oil trough, G, from which it runs into the bearing through an oil hole. The crosshead pin is supplied by the tube marked, E, the oil drops into the cup, H, and fills the cavity between the bolt and inside of crosshead pin and the oil grooves. The oil dropping from the crosshead is caught in two pans attached to the inside of the covers. From these oil pans it runs down the inside of the cover dropping into a cup in the top of the main bearing cap. Instead of oil grooves at the top and bottom of the main bearing, as ordinarily made, in this system the oil is supplied at the sides where the bearing is cut away at the joints. When the strain from the connecting rod is up, the oil is carried to the bottom of the bearing, but when the load is reversed, there are no oil grooves to carry away this oil. The crank pin is oiled through the tube marked, D. This tube discharges into a crank oil ring inside the eccentric, which in turn discharges into the crank pin oil tube, and flows across the crank pin bearing. The crank pin oil ring in addition to its independent supply catches the drip from one end of the main bearing. The eccentric is oiled by the drip which it catches from the

other end. Not the least difficulty has been experienced in catching the oil thrown off the eccentric strap, and the splash from the crosshead has been equally easy to take care of, the outside of the engine being absolutely free from oil. A portion of the oil as it drops back into the bottom of the frame drops upon an oil filter, by which it is thoroughly cleaned and purified. The large base gives the oil an excellent opportunity to cool and settle.

In their own shops the manufacturers have been experimenting with this engine for some two years past, and in connection with their experiments relate an interesting experience. An engine was adjusted and filled with oil on March 10th; up to July 15th no adjustments of any character had been made, and no oil added except to fill the sight feed cylinder lubricator. It has been operating from fourteen to sixteen hours per day driving a blower, and after the lapse of over four months really needed no adjustment or fresh lubricant, running almost as noiselessly as at first. The builders state that they expect every engine turned out to operate in an equally satisfactory manner. This engine is particularly valuable where continuous operation is required or peculiarly heavy duty is imposed upon the engine, as in driving blowers, dynamos, pumps, etc. Further information can be obtained from the designers and builders, American Blower Company, Detroit, Mich.

ALTERNATING CURRENT MACHINERY.

The Crocker-Wheeler Company, of Ampere, N. J., has been manufacturing direct-current electrical machinery for more than sixteen years. At the beginning this output consisted of small motors, but new machines were added and an electric generator for lighting and power was put on the market. Several of these large electric generators formed the power plant of the Intramural Railway at St. Louis Exposition. The application of electric motors to all sorts of industrial machinery, including textile mills, factories, etc., has from the start been a specialty of the company. New machines are constantly being added to the line. One of the most radical expansions which the business has undergone is noted in a recent an-



AN ALTERNATING CURRENT GENERATOR.

nouncement. This is to the effect that the Crocker-Wheeler Company has entered the alternating current field.

The alternating current business has for years been very largely experimental. It is only lately that alternating current work has approached standardization. It is at this point that the company has taken it up. In order to avoid experimenting, the company secured the American patents of the celebrated Swiss engineers, Brown, Boveri & Cie., and has therefore been enabled to begin the work where the Swiss firm left off and build machines thoroughly adapted to American practice. The immediate success of the company in the new field has been marked. Our illustration shows one of the alternating current generators which have been built in the last few months. A recent order has been received to build three 4,000 KW. alternating current generators, the largest of their type in the world, which are to supply power for all the street railways in San Francisco.

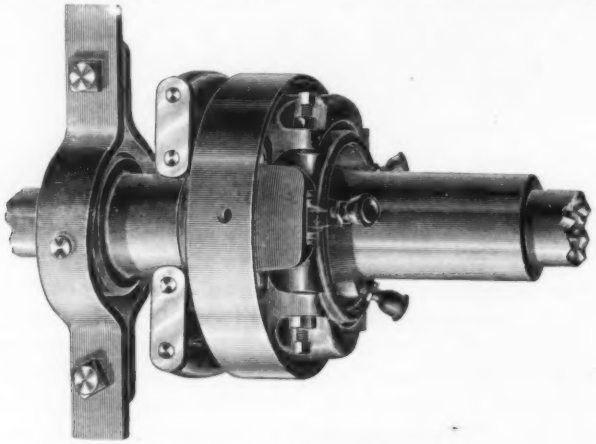
THE "BULL DOG" FRICTION CLUTCH.

No one who is at all familiar with apparatus for transmitting power can have failed to notice the rapid development in this line and especially in friction clutches and couplings. Some of the devices possess great merit, while others based either upon wrong principles or constructed simply to provide a cheap substitute, have proved unsatisfactory.

Charles C. Klein, Marshall St., below Cambria St., Philadelphia, Pa., has endeavored to overcome the various difficulties encountered in friction clutches, by a clutch construction in which the friction members move tangentially to produce the pressure. It is known as the "Bull Dog" friction clutch. A flexible ring is fitted over a cylindrical head. The ring being open or split at one point of its circumference is capable of being clamped tightly over the head. Among the advantages claimed for this clutch are the following:

1. It is balanced at all speeds.
2. It is very easily readjusted to compensate for wear.
3. It is not affected by wear on the shaft.
4. It wears down to a uniform cylindrical surface.
5. It will remain where clutched and will remain out of gear when thrown out.
6. The friction surface can be renewed at a trifling expense and by unskilled labor.
7. Dampness does not affect the clutch.
8. Every part is visible at all times and yet the friction surfaces are covered in such a manner that dust cannot settle upon them.

Some of the "Bull Dog" clutches were installed in 1893 in a paint factory where the dust made lubrication exceedingly difficult. After ten years of continuous daily service the hole was found to have worn one-eighth larger than the shaft. The friction surfaces were renewed at a cost of twenty-five cents,



THE "BULL DOG" FRICTION CLUTCH.

a self-lubricating bronze bush was introduced and they are today doing their usual work. We are informed that a 4 1/2-inch clutch has lately been installed to drive a 28-inch circular saw for sawing hickory wood. The clutch runs at the high speed of 700 revolutions per minute and is doing the work very satisfactorily.

It is no usual thing that repeat orders are received for this clutch, and in this way one factory has installed six, another has four, and still another has fourteen of these clutches in successful operation. This clutch is equally well suited for high as well as low speeds, for light or heavy work and for couplings that are connected and disconnected either frequently or at long intervals. It is well designed and therefore harmonizes well with any modern machine, thus aiding the sale of machines to which it is attached.

By addressing the manufacturer, Charles C. Klein, Marshall St., below Cambria St., Philadelphia, Pa., his representatives will call with a working model and will further explain its merits.

"ALL STEEL" RING TRAVELERS.

An important improvement in ring travelers has been adopted by the De Haven Mfg. Co., Brooklyn, N. Y., and consists in the use of steel, the carbon being worked into the wire in the raw state. This is said to ensure an equal distribution and a larger percentage of carbon than by the case hardening process. The new process is a distinct advance from the old by which the carbon was injected more or less irregularly after the traveler had been formed to the desired shape. This old method gave a product that was practically case hardened iron, although popularly accepted as steel. The manufacturers of the "all steel" traveler state that the difference between the two kinds of travelers referred to can be readily observed even by those not thoroughly posted on steel by breaking one of each and examining the fracture with a strong magnifying glass. The smooth, dull gray, silky surface of the new process traveler compares favorably with the fractures of razors, drill rod, or any high speed tool steel, while on the other hand, the case hardened traveler will show a coarse, porous surface full of bright shiny spaces indicating crystallization of the metal and a soft, uneven structure.

The desirability of the hard steel traveler is obvious to any one who knows the requirements. The traveler will wear more evenly and all the travelers on a frame will wear alike, other conditions being equal. They will polish new rings more smoothly and quickly, giving them a glass-like surface which insures smooth running and lighter running travelers. This enables a spinner to use a heavier traveler on very fine work. As travelers run they wear, and as they wear they become lighter, therefore anything that lengthens the period of wear is an advantage.

Fig. 1

Fig. 2

English is in future to be an optional subject in all public schools in Saxony, on the ground that it is "the most widely used civilized language in the world."

In 1860 there were three worsted mills in the United States with an annual product valued at $3,701,378; in 1890 this had increased to 143 mills with an annual product valued at $79,194,652.

Dyeing, Bleaching, Printing, Etc.

RESISTS FOR BLACK DYED COTTON HOSIERY.

This is a very important process for the manufacture of cotton hosiery and is a proposition that should engross the consideration of textile colorists, but with the exception of a few isolated experiments, it has received but little attention, and at the present time our knowledge of the subject is rather limited.

The question is one that naturally resolves itself into three broad divisions, each dependent upon the nature of the dyestuff to be used for the ground or body color, and these divisions are as follows:

Direct dyeing blacks.

Diazotized and developed blacks.

Aniline blacks.

Resists printed by any suitable means upon manufactured hosiery before dyeing and then to be subsequently dyed with the direct colors in the usual manner necessary for such dyes, must of necessity withstand the long boiling required for these dyes which without doubt is not possible, for the reason that during the boiling any chemical resist that could be applied would be dissolved or so discolored as to lose its value as a resist. Some few years ago it was suggested to apply such a resist prepared with blood albumen and steamed to fix it on the fibres, but the cost was such as to prohibit its use, and further, the dyestuff stained very considerably the "resist" that was applied. The dyeing of the second group of colors upon a resist on hosiery is also doubtful for the same reason, viz., the lack of power of the resist to withstand the boiling necessary to fix the dye, to say nothing of the subsequent diazotizing and developing operations. If the hosiery is to be dyed with aniline black then there is a possibility of some success and the following compositions may be found of service

Resist No. 1.

Make a thick solution of 4 pounds of dextrine with 1 gallon of water and mix into it 6 pounds of a solution of sodium arsenite standing at 70 degrees Tw. (This is a poisonous salt and should be handled with caution.) Print, dry and dye in the usual manner.

Resist No. 2.

Make a paste with 3 1/2 pounds of dextrine in a solution of 1 gallon aluminate of soda at 30 degrees Tw. Print, dry and dye.

Resist No. 3.

Make a paste or thick solution of dextrine and water, and add to each gallon 1/2 pound of sulphocyanide of potassium. This is applied in the same manner.

All things considered perhaps the most satisfactory method for producing patterns upon dyed hosiery is to adopt that of discharging, wherein the dyed color is destroyed by means of proper chemical agents that act only on the dye and leave the fibre in good condition.

For the direct dyeing colors this is a very simple matter, depending upon the particular dyestuff employed for the ground or body color. The following discharges are suggested:

White Discharge G for Short Steaming.

	Parts.
Acetate of Tin, 290 Tw.	60
Wheat Starch	18
White Dextrine	24
Citric Acid	3 1/2
Tin Crystals	36
Sodium Acetate	9

Acetate of tin solution, 29 degrees Tw., should always be prepared fresh in the following way: Dissolve 20 pounds tin crystals in 5 1/2 gallons hot water, cool by adding 6 1/2 gallons cold water, and add 10 pounds soda ash dissolved in 11 gallons water, stir well, filter, wash, and drain. This gives "tin paste," which is then dissolved in the smallest quantity of glacial acetic acid necessary for complete solution and dilute to 29 degrees Tw.

Another good discharge is

White Discharge No. 2.

	Parts
Wheat Starch	9
Water	9
White Dextrine	24
Tin Paste (as above—not the acetate)	54
Sal Ammoniac	16
Tartrate of Ammonium	20
Tragacanth Paste (65 to 1,000)	17

Print these on the dyed and dry goods and steam.

Zinc Dust Discharge.

Several types of this kind of discharge are in use, but the following is one of the best;

	Parts
Zinc Dust	20
Dextrine solution (1 to 1 of water)	37 1/2
Hyposulphite of Sodium solution 72 degrees Tw.	6

These discharges are useful for direct blacks and also for those diazotized blacks that have been either developed with beta naphthol or resorcine.

Of course whether it is proposed to adopt either the resist style or discharge style it will be necessary to provide proper appliances to carry on the work, and this is particularly so if the more practical and certain discharge style is employed, for which there will be needed a steam chest so arranged that the stockings while boarded and printed may be hung until the steaming is over, and a washing machine if the tin discharges are used or a brushing machine if a zinc-dust discharge is employed.

If a good resist for black hosiery can be devised or a series permitting a range of shades to be dyed over them and of such permanence as to pass through the prolonged direct color dye bath, or the diazotizing and developing bath, a very valuable process will be had. Although it is quite possible for print cloths there are certain mechanical difficulties to be met in handling hosiery, to say nothing of those of a chemical nature, for there are a number of dyestuffs that are applied to cloth which would never be applied to hosiery, so that the processes available for one class of goods are out of the question for others.

Resist printing for many goods has given way to discharge printing, mainly on account of the difficulty of procuring sharp outlines of the patterns, but, perhaps, for hosiery the use of this style, if it were possible, would be of no importance.

SCOURING AND DYEING OF WOOL.

The importance of thorough scouring of raw wool cannot be overestimated, and it is to be regretted that this foundation process, as it were, receives but scant attention. If wool is insufficiently scoured the dyed color will not only be uneven, but it will crock and in many cases the lustre of the fibre will be impaired.

The following details of scouring processes have given excellent results on a large scale for many years, and can be used with safety. For each 100 pounds of wool use 12 pounds soda ash and 3 pounds carbonate of ammonia (or 2 pounds borax) in 300 gallons of water. The duration of immersion in this scour liquor varies in a few mills, but as a rule is about 10 to 15 minutes at a temperature of 100 degrees F. From the first tank it is passed on to a second tank, heated to the same temperature but containing 10 pounds of soda ash only. From this treatment it is finally washed in clean lukewarm water, and then dried to be subsequently oiled, or while still wet it can be sent to the dyer to be mordanted.

Yarn is scoured to remove oil, dirt, etc., consequent to the spinning processes and the most effective scour is made with 5 pounds of ammonia water to each 100 gallons of water, the temperature kept below 90 degrees F. Piece goods are scoured in a solution similar to that used for raw wool, the temperature being allowed to rise as high as 115 degrees F. without danger to the fibres. In all cases thorough washing is essential after the scouring so as to remove every trace of soap which would lead to uneven results in dyeing.

MORDANTING.

For alizarine colors, while there are many

special fixing baths, etc., the usual wool mordant is

3 lbs. Bichromate of Potash.
2½ lbs. Argols, in
300 gals. water.

Gradually raise the temperature to the boiling point, and boil for 1 1/2 to 2 hours. Lift, wash well, and dye. This mordanting bath has been modified in many ways, perhaps the most notable being the substitution of lactic acid for the argols, and although it effects a saving of the chrome, it is so energetic in its action that at times uneven results are to be traced to it.

DYEING.

When using the true alizarines, a certain small amount of acetic acid is necessary to correct the lime in the water, and usually 4 ounces is found sufficient for the purpose for each 100 gallons of water.

The dyestuff is mixed with about 25 times its volume of the acidified water from the dyebath, and worked with a stick so as to form a cream, which is poured into the bath through a fine sieve. The wool is thoroughly wetted out, entered into the dye liquor at a low temperature so as to insure even and regular dyeing. The temperature may reach 120 degrees F. for heavy, full shades, but for medium and light shades should not go above 90 degrees F.

The low temperatures are used for commencing the dyeing, after which a further quantity of color is added, and the temperature raised to the boiling point, where it is kept for 2 hours, the wool being turned evenly all the time.

This long boiling is absolutely necessary so as to secure thorough fixation of the coloring matter, and such wool loses very little color on milling, due to the fact that the chrome on the fibre and the color have thoroughly united during the boiling, and consequently are fixed. Colors dyed this way do not bleed or crock, but they require careful preparation of the stock and good manipulation in the dyebath.

If the color bleeds after such treatment the defect can be traced to insufficient scouring in the first instance.

A number of so-called alizarine dyestuffs are used in an ordinary acid and Glauber's salt bath, and fixed by means of certain salts of chromium, usually in the exhausted dyebath, but it cannot be expected that such colors are as fast as those which are fixed upon a chrome mordant. This will be specially noticed if comparative exposure tests are made, the dyeing that has been "fixed" with a chrome salt in the bath will as a rule weaken under the treatment, while the chrome mordanted color rarely changes its shade. Again a chrome mordanted color is always capable of resisting a strong alkaline milling, where another class of dyes would bleed very seriously.

Where it is desired to obtain the fastest shades to all influences, observance of the above points in scouring, mordanting and dyeing will always give the most reliable results.

THE CROCKING OF INDIGO DYED WOOL GOODS.

A correspondent makes inquiry regarding the prevention of crocking in indigo dyed woolen goods, and perhaps unconsciously raises a question of very great importance to dyers and manufacturers of all such goods. The importance of the question is emphasized by the fact that the extended use of chrome mordant blues, other than logwood is based upon this apparent defect of indigo when applied to wool, and that every effort is made to discredit the latter dyestuff, which has, however, in the hands of a skilful dyer many excellent qualities that are not approached by even the best chrome or other artificial blue dye.

Indigo is dyed upon wool according to two general processes, the working details of which were once very carefully guarded as being trade secrets of the greatest value, but since the era of enlightenment has taken hold of the progressive dyer, the processes have become almost universally known, and consequently improved.

The first process of importance is based upon the chemical reduction of the indigotine of the indigo when in a state of very fine division, by means of a bacteria that is propa-

gated at certain temperatures of the bath, and in the presence of proper chemicals. This bath or vat is "set" with due regard to surroundings, temperature, condition of the atmosphere, etc., all of which have an influence for or against the proper condition for best results. It may be well to mention that the bacteria referred to is a species of microscopic organisms that are developed at the expense of the other organic ingredients of the vat, and their control is of the utmost importance to the dyer, and this control is varied as the dyeing progresses by regulating the amount of acid or alkali in the vat, which varies from time to time in the same vat.

The typical fermentation vat is known as the woad vat, and is generally "set" in the the following manner: Volume of vat 100 gallons; throw in 75 pounds of woad and cover with the full volume of hot water and allow to steep all night, giving it a thorough raking so as to insure every particle becoming wet; in the morning add from 7 to 8 pounds of ground madder, 12 pounds of bran, a cream made with 5 pounds of freshly burned lime and sufficient water and 2 1/2 pounds of soda; mix well together and add finally 5 pounds of indigo that has been finely ground with water. The vat is now started by bringing the temperature to 120 degrees F., controlling it with a thermometer, and maintaining it for a few days, usually three, when it should be "working" or fermenting very quietly. At this point the delicate control of the working is necessary. Should it be too active it may be arrested by adding a further quantity of lime, but should it require accelerating, bran may be added. Some dyers substitute molasses with equally good results.

The proper working condition of this vat is known by the odor of ammonia that arises and the rich olive brown shade of the solution, when it is ready for dyeing, and can be so employed for a long time—in fact, until the deposit which always forms increases to such an extent as to dirty the wool. Wool dyed in such a bath will always crock, because this deposit is not dyed in the fibre, but rather lodges on the surface, so that any friction applied will loosen it and it will also show itself when soaped. Continuous working of this form of vat is also to be recommended so as to give it a chance to recover itself by redissolving the always forming fine scum of insoluble indigo blue, which otherwise would attach itself to the fibres and give rise to the defective goods objected to. Such a bath is replenished by daily additions of indigo, bran and lime in quantity equivalent to that removed by the dyeing.

The next form of indigo vat, and one which is gaining in importance is known as the hydrosulphite vat, and is easy to prepare and maintain, and clean in operation. It is strictly a chemical vat, depending only upon the action of certain chemicals for its activity and not upon bacteria. An advantage that this indigo vat has over others is that a strong reduced indigo stock solution is kept always in readiness, so that replenishing is a very easy matter. The "hydrosulphite" is prepared by acting upon zinc dust with bisulphite of soda and the resulting solution of 60 degrees to 62 degrees is used, to which is then added finely ground indigo and milk of lime, heating to 150 degrees F., until a clear greenish solution results. Such a solution containing about 1 pound of indigo to the gallon is a strong stock solution, and is added directly to the vat, which is worked at a temperature of 120 degrees F. The precaution to guard against in using this vat is to stop dyeing as soon as it is noticed that the vat liquor is greenish, showing that it is slightly oxidized, as dyeing in such a bath will only yield shades that crock. To remedy this heat to 160 degrees F., add a little milk of lime and clear "hydrosulphite," which in a short time will again reduce to a soluble form the oxydized indigo.

From the facts above given regarding the control of the two indigo vats, it is seen that if in either case the indigo becomes "reduced" while in the vat shades will be obtained devoid of fastness, resulting from a deposit of insoluble particles of indigo on the fibre rather than an oxidation of the reduced indigo in the fibre, a condition which alone can give fast, non-crocking shades.

Woolen goods, indigo-dyed, that crock are difficult to remedy, washing alone will not remove the defect and to soap them is in some instances out of the question. Proper control

of the vat, by whichever process operated, is the surest way to overcome the trouble.

DEGUMMING AND BLEACHING OF SILK.

The processes of degumming or stripping of silk and bleaching are so closely identified with each other that to treat of one and not the other seems difficult, for the reason that degumming always precedes bleaching for the better qualities of silk.

Degummed silk is divided into three main classes, designated technically "boiled off," when all the gum is removed and only the clean fibre remains; "souple," silk that has lost only from 8 to 12 per cent. of the gum originally on it, and "ecru," a partially boiled-off silk that has lost only from 3 to 4 per cent. of gum.

As is readily seen the only difference in the silks is the varying amounts of gum removed. The maximum quantity on the silk before boiling is about 30 per cent. for ordinary silk, but only 20 per cent. or even less for tussah or wild silks.

The coloring matter of ordinary silk is always to be found in the sericin or gum and not in the fibre so that when such silk is well boiled off and only clean fibre remains there is but little bleaching to be done. With tussah silk, on the other hand, the greater part of the coloring matter is to be found in the fibre itself, so that bleaching in this instance is a matter of considerable importance. Bleaching of silk is possible without the use of any preliminary soap-baths, but as sericin is somewhat soluble in hot water, it is to be seen that a certain amount will dissolve. The great difference between the three grades of sik is dependent upon the soap treatment. In making the first, the idea is to remove entirely all gum and for this purpose strong and nearly boiling solutions of soap are employed and which are repeated two or more times according to the "feel" of the silk. In preparing "souple" silk weaker baths are employed, and the operation is conducted at a lower temperature, while for "ecru" silks the strength of the soap baths is very much weaker and the temperature correspondingly reduced.

All operations where silk is being treated require that the softest water be used so that the fibres shall retain their natural softness and especially where soap is used, otherwise there will be a loss of soap and a certain harsh or sticky feel given to the silk. If hard water only is obtainable then it must be corrected by a proper addition of soda-ash or ammonia. Now that borax is to be had at a reasonable price and of very great purity it can be used for a similar purpose, with the very best results, and with no fear of the silk being harsh.

The quality of the soap used in "boiling-off" is a matter of much importance, and only the best quality made from olive oil should be used. In this connection, however, there are a number of good silk soaps now made that do not contain olive oil and which answer the purpose very well.

The process of "boiling off" consists in giving the silk a series of baths each at the boil, the strength of the soap solutions being such as to have 3 pounds of soap and 4 gallons of water for each 10 pounds of silk. The silk is hung over wooden poles in the bath which is heated up with a coil. The immersion of the silk in this bath is about 3/4 to 1 hour, when it is removed and hung in the second bath for 1 to 2 hours, and containing from 10 to 15 per cent. of soap on the weight of the silk.

For "souple" silk only one bath is used, containing about 10 per cent. of soap and the temperature at or below 100 degrees F. For "ecru" silk no soap is used, only the solvent action of water is made use of.

The spent soap baths are of considerable value to the dyer, who uses them either as they are or with the assistance of a slight amount of acid. Such liquors are of value in producing level shades.

Silk bleaching is very often done with sulphurous acid, and is applied either in the usual stoves or by immersing the silk in a bath of an alkaline sulphite or bisulphite and liberating the sulphurous acid gas by means of a mineral acid. This style of bleaching is not satisfactory when compared with the results secured by other and newer processes, especially the peroxides, the details of which have been recently given in these pages.

Tussah silk, the so-called wild silk, differs

in many ways from the ordinary silk, especially in the matter of bleaching, which has not been satisfactorily done. A combination process of degumming and bleaching is applied to this fibre, and which has given good results is as follows Treat the silk with dilute hydrochloric acid to remove the mineral constituents such as lime, iron, etc., and which will also remove much dirt and some of the gum. Wash to remove traces of acid and then give a passage through a bath made up into 10 to 15 per cent. of soap on the weight of the silk and afterwards steep in a bath for 24 hours in a solution made by treating a solution of bleaching powder and soda ash until no more precipitate falls, this ought to be used at 10 degrees Tw.

Finally treat with dilute hydrochloric acid at 2 degrees Tw. for half an hour, lift and finish the bleaching with peroxide of hydrogen or equivalent of peroxide of sodium, together with soluble (water) glass.

Bleaching tussah silk is a problem of vast commercial importance, but it has not received scientific treatment at the hands of investigators.

Bleaching Cotton Goods.

Editor Textile World Record:

Our process of bleaching cotton goods gives us trouble. Sometimes the goods are streaked and have a harsh feeling that we ascribe to the lime. Is there no process of thoroughly removing this lime? We prepare our lime bleach in barrels and dip it out, but we think this probably stirs up the deposit and makes the trouble. Please tell us how to construct a tank for the purpose.

John Drum (487).

While this question gives no definite information about the goods and the methods used in bleaching them, I believe the streaks are caused not by the chloride of lime solution, but because the goods are not properly boiled out or "bottomed." If the goods are boiled from four to eight hours in a kier, either with or without pressure, using from four to seven pounds of caustic soda to the hundred pounds of goods, then washed well to remove the lye, bleached at 1° Tw. with chloride of lime solution, thoroughly washed and soured with sulphuric or muriatic acid at 1° Tw., again thoroughly washed and soaped, they will be bleached white and free from streaks or stains.

John Drum's custom of mixing the chloride of lime in barrels is good, cheap and efficient, but the solution ought to settle for three or four hours and be strained through a fine sieve into a hogshead and used from that. Where large amounts are used daily a mixing tank is used. This has an upright shaft with two blades attached which serves to agitate and dissolve the bleaching powder. After the powder and water are thoroughly mixed, it is allowed to settle and then drawn off into a storage tank until needed for use.

A durable tank can be economically built of brick lined with cement and so arranged that the mixed solution can be run off into storage tanks by gravity, or if desired the solution can be pumped out whenever necessary.

The trouble with many bleachers is that they do not understand the principle of bleaching. They seem to think the chloride of lime does all the bleaching when as a matter of fact, it does only a part. Goods which are not thoroughly boiled in some lye to remove resinous and fatty matters cannot be well or permanently bleached. Goods which have been sized or starched previous to bleaching require this boil to remove the starch, and the lye acts on the fats used in the starching to form a soapy solution which helps to bleach the goods. In order to get a good permanent bleach one must start right by boiling the goods well and then a good, white, lasting bleach will be assured.

Baumwolle.

New Color Cards.

Dyeings on Woolen Cloth; Cassella Color Co., 182 Front St., New York City.

Twenty-four samples of woolen cloth, dyed different colors and discharged with Hyraldite W.

Cassella Color Co., 182 Front St., New York.

A card showing 48 samples of printed yarn, 24 being discharged with Hyraldite and 24 printed with Immedial colors.

Benzo Dark Brown Extra; Farbenfabriken of Elberfeld Co., New York City.

One sample of raw cotton and one of cotton yarn showing 2 and 3 per cent. dyeings respectively of Benzo Dark Brown Extra.

Katigen Brilliant Black B and Katigen Blue Black N B; Farbenfabriken of Elberfeld Co., New York City.

Four samples of cotton yarn showing 16 per cent. dyeings of Katigen Brilliant Black B and Katigen Blue Black N B Extra.

Alizarine Green C3G Paste; Farbenfabriken of Elberfeld Co., New York City.

Two samples of woolen yarn dyed Alizarine Green C3G Paste.

X L Yellow; Read Holliday & Sons, Ltd., New York City.

Two samples of woolen yarn showing 2 per cent. dyeings with X L Yellow G and X L Yellow 2R.

Calcutta Black; Read Holliday & Sons, New York City.

Two samples of cotton yarn and two of cotton piece goods showing 5 and 6 per cent. dyeings of Calcutta Black 3B and 3G.

Anthracene Chrome Blue; Cassella Color Co., New York City.

Five samples of woolen piece goods dyed with different percentages of Anthracene Chrome Blue F, G, R and BB. Some of the samples show striped effects made by the introduction of cotton which remains white during the dyeing process.

Hyraldite A; Cassella Color Co., New York City.

Twelve samples of piece goods, including all wool, silk and cotton, wool and cotton and cotton, stripped with Hyraldite A, for which full directions are given.

White and Red Effects on a Brown Ground; Cassella Color Co., New York City.

One sample of cotton and one of woolen piece goods, dyed with 2 per cent. Diamine Nitrazol Black B, topped with Paranitraniline C, printed with Hyraldite W and a chlorate discharge.

Fast Light Yellow 2 G; Farbenfabriken of Elberfeld Co., New York City.

One sample of woolen piece goods dyed Fast Light Yellow 2 G.

Diamond Black P 2B; Farbenfabriken of Elberfeld Co., New York City.

One sample of woolen yarn and one of woolen piece goods showing 7 and 6 per cent. dveings respectively with Diamond Black P 2B.

Diazo Brilliant Scarlet; Farbenfabriken of Elberfeld Co., New York City.

Four samples of cotton yarn dyed with Diazo Brilliant Scarlet G, B, 3B, and 6B, respectively.

Indigo MLB; Philip S. Clarkson. Published for distribution by H. A. Metz & Co., New York.

This handbook has been compiled in order to give in convenient form to the dyeing trade the results of some experiments with synthetic indigo. Following are the titles of the ten chapters: History and Description; Theory of Indigo Dyeing; Wool Dyeing; Cotton Dyeing; Modified Indigo; Indigo Printing; Indigo Extract; Tests for Indigo; Indigo Analysis; Reference Books.

Dyestuffs for Textile Dyeing; Berlin Aniline Works, New York City.

Under this title the Berlin Aniline Works have issued an attractive volume of over 400 pages, containing a classified list of the various dyes now on the market, together with much valuable information regarding their properties. The following abstract of the table of contents will give some idea of the ground covered:

Properties of dyes; dyestuffs for all the different textile fibres with recipes for their application, including the acid, basic, substantive, metachrome and sulphur dyes; and a long series of tables showing the properties of the dyestuffs in their application on the various fibres.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

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Recipe No. 1.

Black on Cotton Yarn.

Thional Black H N on 100 lbs. cotton yarn. Prepare the first dye bath with

14 lbs. Thional Black H N.
(Thos. Leyland & Co., 53 India St., Boston.)
40 lbs. Sodium Sulphide.
10 lbs. Sal Soda.

Dissolve the above thoroughly at a boil and then add

50 lbs. Common Salt.

Enter the yarn and dye for one hour at or just below the boil. For subsequent baths one-half the above amounts will suffice.

Thional Black H N gives a green shade of black and is especially suited for mercerized yarn, giving a deep shade without bronzing. Its fastness is excellent in all respects.

Recipe No. 2.

Yellow on Woolen Yarn.

X L Yellow G on 100 lbs. woolen yarn. Prepare the dye bath with

2 lbs. X L Yellow G.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)
10 lbs. Glauber's Salt.
3 lbs. D O V.

Acetic Acid may be substituted if desired.

Enter yarn boiling and dye boiling half an hour.

X L Yellow G yields a pure green tone of yellow and is an excellent leveling dyeing color.

Recipe No. 3.

Blue on Cotton Yarn.

Direct Blue G on 100 lbs. of cotton yarn. Prepare the dye bath with

3 lbs. Direct Blue G.
(Edwin M. Thayer & Co., 106 Broad St., Boston.)
20 lbs. Common Salt.

Bring the bath to a boil, enter goods and continue the boiling for one-half hour.

Direct Blue G dyes very evenly and exhausts remarkably well for a direct cotton color. It is valuable not only as a self color, but for the pro-

duction of compound shades, as it does not streak even in heavy shades.

Recipe No. 4.

Red on Woolen Cloth.

New Azo Coralline on 100 lbs. woolen cloth. Prepare the dye bath with

4 lbs. New Azo Coralline.
(C. Bischoff & Co., 88 Park Pl., New York.)
4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter at 170 deg. F., bring to a boil and dye at a boil for one hour.

New Azo Coralline dyes exceedingly level and is excellently suited for the dyeing of woolen flannel.

Recipe No. 5.

Orange Red on Worsted Yarn.

Orange R O on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Orange R O.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 170 deg. F., bring to a boil and dye at a boiling temperature for one hour.

Orange R O dyes easily level and possesses excellent coloring power.

Recipe No. 6.

Black on Cotton Yarn.

Mercaptol Black T Extra on 100 lbs. cotton yarn. Prepare the dye bath with

9 lbs. Mercaptol Black T Extra.
(Sykes & Street, 85 Water St., New York.)
18 lbs. Sodium Sulphide.
6 lbs. Soda Ash.
100 lbs. Common Salt.

Dye at a boil for one hour.

The above amounts are given for the first bath. For the second bath the dyestuff may be reduced to 7 lbs. and in the third to 6 lbs. and the other ingredients accordingly.

Recipe No. 7.

Yellow on Cotton Yarn.

Thiogene Gold Yellow A Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Thiogene Gold Yellow A Conc.
(H. A. Metz & Co., 122 Hudson St., New York.)
16 lbs. Sodium Sulphide (Crystals).
5 lbs. Soda Ash.
40 lbs. Common Salt.

Boil up the bath, then enter yarn, and dye just below the boil for one hour.

Thiogene Gold Yellow A Conc. is a new sulphur color giving a clear golden yellow tone somewhat redder than those produced by the older Thiogene Yellows. It is suitable for all classes of cotton.

Recipe No. 8.

Black on Raw Cotton.
Dyed in Cohnen Machine.

Thiophenol Black T Extra on 100 lbs. raw cotton. Prepare the dye bath with

10 lbs. Thiophenol Black T Extra Patented.
(A. Klipstein & Co., 122 Pearl St., New York).
25 lbs. Sulphide Sodium Crystals.
5 lbs. Soda Ash.
25 lbs. Salt.

Boil twenty minutes, pump out dye liquor (three to five minutes) turn on air pump and oxidize twenty minutes. Wash and whizz.

Note: These operations are all carried on in the Cohnen dyeing machine without handling the stock except to pack the machine and unpack when stock is ready for drying.

Recipe No. 9.

Blue on Raw Cotton.
Dyed in Cohnen Machine.

Pyrogen Indigo A F on 100 lbs. raw cotton. Prepare the dye bath with

8 lbs. Pyrogen Indigo A F.
(A. Klipstein & Co., 122 Pearl St., New York.)
16 lbs. Sulphide Sodium.
5 lbs. Soda Ash.
25 lbs. Salt.
2 lbs. Oleron Soap.

Boil twenty minutes, oxidize twenty minutes. Wash and whizz.

Note: These operations are all carried on in the Cohnen dyeing machine without handling the stock except to pack the machine and unpack when stock is ready for drying.

Recipe No. 10.

Scarlet on Worsted Yarn.

Milling Scarlet 4 R Conc. on 100 lbs. worsted yarn. Prepare the dye bath with

2½ lbs. Milling Scarlet 4 R Conc.
(H. A. Metz & Co., 122 Hudson St., New York.)

10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

In dyeing goods that dye uneven use

10 lbs. of Ammonium Acetate

in place of the Acetic Acid.

When great fastness to milling is desired add

2 lbs. of Chromium Fluoride,

or

1 lb. Potassium Bichromate,

after the bath has been exhausted, and boil one-half hour longer.

Milling Scarlet 4 R is a new wool scarlet and well suited for the dyeing of wool when brilliancy of shade and fastness to light, milling, rubbing, sulphur and washing are desirable.

Recipe No. 11.

Black on Cotton Yarn.

Calcutta Black 3 G on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Calcutta Black 3 G.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)

Dye half an hour at the boil with the addition of Common Salt or Glauber's Salt and Soda Ash; wash off and work a quarter of an hour in the diazotizing bath, which is stuffed with

3 lbs. Sodium Nitrate and
10 lbs. Spirits of Salts.

Rinse and work half an hour in the developing bath, made up with

¼ lb. Black Developer C,

dissolved by mixing it into a paste with twice its weight of Caustic Soda, then pouring boiling water over it while stirring. Calcutta Black may be applied to any form of cotton, and is fast to milling, scouring, washing and cross-dyeing.

Recipe No. 12.

Blue on Worsted Yarn.

Brilliant Milling Blue B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Brilliant Milling Blue B.
(Cassella Color Co., 182 Front St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 180 deg. F. and dye at a boil for one hour.

Brilliant Milling Blue B is excellently suited for dyeing all kinds of woolen material and possesses excellent fastness to milling.

Recipe No. 13.

Brown on Worsted Yarn.

Acid Brown D 197 on 100 lbs. worsted yarn. Prepare the dye bath with

¾ lbs. Acid Brown D 197.
(Berlin Aniline Works, 213, 215 Water St., New York.)
3 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 140 deg. F., bring to a boil and dye at a boiling temperature for one hour.

Acid Brown D 197 will be found to produce a fashionable shade of brown.

Recipe No. 14.

Green on Cotton Yarn.

Diamine Green C L on 100 lbs. cotton yarn. Prepare the dye bath with

1½ lbs. Diamine Green C L.
(Cassella Color Co., 182 Front St., New York.)
1½ lbs. Soda Ash.
20 lbs. Glauber's Salt.

Enter at 180 deg. F. and dye at a boil for one hour.

Diamine Green C L is characterized by its full bluish green shade and also for its very good fastness to alkalies.

Recipe No. 15.

Brilliant Blue on Worsted Yarn.

Brilliant Wool Blue G (Extra) on 100 lbs. of worsted yarn. Prepare the dye bath with

1½ lbs. Brilliant Wool Blue G (Extra).
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 170 deg. F. and dye at a boil for one hour.

Brilliant Wool Blue G (Extra) possesses remarkably level dyeing properties and coloring power, and is fast to alkalies, washing, stoving and perspiration.

Recipe No. 16.

Brown on Worsted Yarn.

Acid Brown D 198 on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Acid Brown D 198.
(Berlin Aniline Works, 213, 215 Water St., New York.)
3 lbs. Sulphuric Acid.
10 lbs. Sodium Sulphate.

Enter yarn at 170 deg. F., bring to a boil and dye at a boil for one hour.

Acid Brown D 198 produces a very dark shade of brown which possesses very good fastness.

Mill News.

COTTON.

New Mills.

*Alabama, Huntsville. Machinery is being installed in the No. 3 Mill of the Lowe Manufacturing Company. It is planned to have the mill running by January 1st, with equipment of 10,000 spindles.

*Alabama, Jacksonville. The building for the new cotton mill has been completed. Part of the machinery has been placed and it is expected that the balance will be set up and ready to start operations March 1st.

*Arkansas, Dardanelle. The Arkansas Cotton Mills Co. (50 Leonard Street, New York) have been incorporated with capital stock of $100,000. John Henry English is president of the company; C. E. Richards, treasurer, and W. A. Price, superintendent. They will start operations in the Dardanelle Cotton Mills, about February, making yarns, 4's to 16's, single and ply, with 3,000 spindles.

*Arkansas, Mammoth Spring. The Southwestern Cotton Mills Company, recently reported incorporated under Providence, R. I., will operate the plant formerly run as the Steele Mills. The mill will be operated exclusively on yarn. Capacity of the plant will be 11,500 spindles at first, but will be eventually increased to 18,000. It is expected to have the entire plant in operation by April 1st.

*New Hampshire, Ashland. Operations have begun in plant recently established here by Donald & Buchan, making tapes and webbing. They operate five looms and sell goods direct.

*South Carolina, Clinton. The Clinton Cotton Mills, whose present capital is $150,000, and operating 18,368 spindles and 500 looms, advise us that they expect to have their No. 2 mill, in which machinery is being installed, in operation about February 1st.

South Carolina, Lockhart. The Lockhart Mills have started work on erection of a new mill, to be equipped with 50,000 spindles. Plant will be known as No. 2 Mill. They contemplate having 25,000 spindles in operation the latter part of 1905. W. T. Garner, superintendent of Mill No. 1, will have charge of both plants.

South Carolina, Yorkville. The Neely Yarn Mill is name under which the proposed yarn mill at this place will be operated. The capital stock is placed at $60,000. W. B. and N. B. Moore, O. E. Wilkins and W. I. Witherspoon are among the incorporators.

Enlargements and Improvements.

Connecticut, Bridgeport. The Bridgeport Elastic Co. is building an addition to the mill.

*Connecticut, Voluntown. The Briggs Manufacturing Company will start operations in their new mill about December 1st, making cotton yarns, 10s to 60s. This mill was purchased by the company about two years ago but they are now getting it ready to operate in connection with their three other mills. This mill is equipped with 3,000 mule and 6,000 ring spindles.

*Georgia, Atlanta. The Exposition Cotton Mills are installing the 8,000 additional spindles in the plant and necessary machinery for same (Saco & Pettee make) with 208 Draper looms.

Georgia, Newnan. An enlargement is to be made to the Newnan Cotton Mills at cost of about $100,000. A new building, 50 by 100 feet, is to be erected and equipped with 8,000 spindles. This will give the company a total of 25,000 spindles, making yarns, twines, etc.

*Georgia. Thomson. The John E. Smith Cotton Mfg. Co. is building an addition, 100 by 140 feet to their mill, in which the new machinery reported previously will be installed. They expect to have the new machinery in operation about January 1st. M. B. Pitts is general manager of the plant.

Illinois, Chicago Heights. The Diamond Braiding Co., located on North Jefferson Street, Chicago, will remove the plant to this place where they will have a floor space of 25,000 feet.

Maine, Biddeford. The Pepperell Mills are to install 500 new Draper looms in the plant.

Maine, Biddeford. A new filter of from 5,000 to 8,000 gallons capacity will soon be ready to be put in operation at the York Dye House.

Massachusetts, Bondsville. New boilers are being installed in the Boston Duck Company's boiler house recently completed.

Massachusetts, Northbridge. One hundred and fifty new looms have been installed in the Rockdale Mill, increasing number to 1,400.

Massachusetts, Pittsfield. It is reported that the J. L. & T. D. Peck Manufacturing Company may erect a new building in the spring and greatly enlarge their thread plant.

*Massachusetts. Springfield. The Bond Manufacturing Company, capitalized at $300,000, will continue the business of the Hutchins Narrow Fabric Co. at the same location. A. C. Veiller is president of the company; E. W. Bond, vice-president and general manager; Charles D. Bond, secretary, and E. D. Harrington treasurer. They expect to build a dyehouse, an addition to the main building and will increase the machinery soon.

New Hampshire, Nashua. The foundation is being put in for new site of counting room for the Nashua Cotton Mills.

New York, Long Island, Patchogue. The Patchogue Mfg. Co. have added a new branch to their business, the manufacturing of Irish Point curtains. A newly equipped bleaching and finishing plant has been erected to bleach and finish the above product. Mr. E. Mittelholzer, a practical bleacher and finisher of these goods, is in charge of this plant.

*North Carolina. Concord. The Lippard Yarn Mills, recently purchased by J. M. Odell, will be started up about January 1st as the Magnolia Mills No. 2. 8 1/2 to 14 1/2 yarns, also 3 plys will be made.

North Carolina, Graham. The Travora Manufacturing Company has installed 100 looms in the plant to make heavy white goods. This plant is equipped with 3,600 mule spindles.

North Carolina, Jonesboro. The Clark Manufacturing Company will instal more looms.

North Carolina. Lincolnton. D. E. Rhyne has purchased the Lincolnton Cotton Mills and will operate same in connection with his other mills.

North Carolina, Raleigh. The Pilot Cotton Mills have recently installed 1,000 additional spindles in the plant. They have also replaced old cards with twelve new ones, and instal two new speeders and one slubber.

*North Carolina, Salisbury. The Kesler Manufacturing Co. is installing 2,500 additional spindles, which, when placed, will give the plant a total of 23,000 spindles.

North Carolina, Spray. The Morehead Cotton Mills will instal additional broad looms in the plant and a large number will be of the Crompton & Knowles make.

Pennsylvania, Philadelphia. Additions to cost $100,000, consisting of a new five-story building, is to be made to the Orinoka Mills, 2747 Ruth St., manufacturers of upholstery goods on 171 looms. The two lower floors of this new structure will be of fire proof construction and the upper floors of slow-burning construction. The dimensions of this operation will be 55 by 178 feet. A two-story boiler and engine house, 46 by 51 feet, is also to be constructed. Work on this operation will be begun during the month of January and will be pushed to speedy completion.

*Pennsylvania, Sellersville. Additional bids are being taken by the Armure Tapestry Mill, 2739 Fairhill St., Philadelphia, on new mill building to be erected here. The building is to be two stories, brick.

Rhode Island, Shannock. The Columbia Narrow Fabric Co., manufacturing cotton and silk elastic and non-elastic fabrics and tape, are to install some additional looms in the plant.

*Rhode Island, Woonsocket. The New England Edging Co. will rebuild their plant recently destroyed by fire, at once. S. T. Stiles is manager of the plant, which manufactures lace edging for ribbed underwear and tape. They use 8/3 to 40/2 cotton skein yarn.

Rhode Island, Woonsocket. The Manville Company has completed installation of a dyeing department in the Social Mill. The basement of the cloth and weighing room has been utilized for the purpose.

*South Carolina, Dillon. Work will begin shortly on the erection of the new addition for the Maple Cotton Mills, previously mentioned as to add 8,500 new spindles. The new building will be 300 by 100 feet.

South Carolina. Edgefield. About six months ago J. L. Eddleman accepted position as superintendent of the Edgefield Mfg. Co. The plant has been closed a short time, but resumed operations about two months ago. Company contemplates increasing plant by enlargement to mill and installing additional machinery in the near future.

*South Carolina, Greers. The Victor Manufacturing Co. have completed addition to the mill. They have installed 25,000 spindles and 600 looms. One hundred more looms will be added later. The new mill is to be operated on fancies and various light weight constructions.

South Carolina, Lexington. The Lexington Manufacturing Co. is building an addition, 60 by 00 feet, two stories, brick, to their mill. They are to increase capacity of plant by installing 3,000 additional spindles, 12 new cards, 3 pickers (Saco & Pettee) and 5 (Woonsocket Machine & Press Co.) frames. The additional machinery will be ready to run in the summer. L. W. Redd is superintendent of this plant.

*South Carolina, Orangeburg. Geo. H. Cornelson is president of the Orange Cotton Mills, recently incorporated with capital stock of $75,000 to operate the mills of same name. W. W. Wannamaker is treasurer of the company and I. M. Wannamaker, superintendent. This plant is equipped with 5,092 spindles for making twine, warp and rope.

*Tennessee, Trenton. Work is well underway on repairs to the Trenton Cotton Mills, of which Albert B. Beachtold is now manager. The plant will be started up early in December.

Mills Starting Up.

*Alabama, Huntsville. It is stated that the West Huntsville Cotton Mills, which have been idle for more than a year, will resume operations some time in January.

Canada, Montreal. The Merchants' Cotton Company, the Dominion Cotton Mills and the smaller plants have started operations on full time, since curtailing some two years ago.

Connecticut, Eagleville. The Eagleville Cotton Mills have been put into operation after an idleness of about six months.

Georgia, Macon. The Bibb Manufacturing Co. is reported to put the Payne Cotton Mill in operation. Work is now under way on making necessary repairs, etc., preparatory to starting up.

*Indiana. New Albany. Arrangements have been made by J. F. Gebhart, for years manager of the New Albany Cotton & Woolen Mills, to start the cotton department of the plant December 1st, and will make warps exclusively. The woolen mill will remain closed until the reorganization of the company is effected.

Massachusetts, Fitchburg. The duck mill at South Fitchburg will start up as soon as their stock is received, which will be about the first of January.

*New Jersey. Braddock. Operations have been started in the Bailey & Steel Mfg. Co.'s plant.

North Carolina, Cumberland. The Cumberland Cotton Mills, which have been shut down for the last two or three months, have been sold to J. Frederick Houston & Co., whose offices are in the Provident Bldg., Philadelphia. The mills will be run as heretofore on cotton warps, skeins, tubes or cones, 8 to 16 single and two ply yarn on 4,160 spindles. The plant is now in operation.

*Rhode Island, Arcadia. Operations have been resumed in the Roger Williams Cotton Mills, which have been closed since last September, owing to repairs.

*Rhode Island, Warren. Operations have been resumed in the Cutler Manufacturing Company's plant.

Wisconsin, Beaver Dam. The Beaver Dam Cotton Mill, which has been closed for several months, has resumed operations.

Mills Shutting Down.

North Carolina, Bessemer City. The Southern Cotton Mills have been closed for two weeks for purpose of making repairs, caused by breaking of a piston rod on the engine.

Pennsylvania, Philadelphia. William Keegan, manufacturer of shirtings and dress goods on 120 looms at Trenton Ave. and Sargeant St., is about to retire from business and the entire equipment of the plant will be sold at auction.

WOOLEN.

New Mills.

*Connecticut, East Killingly. The Interstate Company, recently reported organized with capital stock of $75,000, will manufacture shoddy extracts and waste. F. A. Jacobs is president of the company and H. E. Bach, treasurer.

Massachusetts, Boston. A company has been incorporated under Massachusetts laws with a capital stock of $500,000, to operate under patents of J. F. Dustin, of Indian Orchard, Mass., who has been connected with the Hodges Fibre Carpet Co. The name of the company is the Dustin Pile Carpet and Plush Co. Mr. Dustin is president and Thomas F. Harrington of the Harrington Credit Clothing Co. is secretary and treasurer. The company is open to negotiations for a location where favorable terms are offered. Will make carpets and rugs.

*Massachusetts, Boston. The Dustin Pile Carpet & Plush Co. will make seamless Wilton art squares in addition to carpets and rugs as previously reported.

*Massachusetts, Saugus. Work has been started in a small way in the Saugus Woolen Company's plant, one set of cards being in operation and work of getting out samples underway. The mills will be running to their full capacity January 1st.

*New Hampshire, North Salem. The Atlas Manufacturing Company has been organized to operate the factory formerly occupied by William H. Hanson. They will install 36 looms for doing commission work for the Brightwood Manufacturing Co., North Andover, and Brown & Whittier and the Crescent Worsted Company, of Lawrence. Joseph C. Brown, of Brown & Whittier, financially interested in the new concern, will probably be manager of the plant.

*New Jersey, Camden. Plans are in progress for the new building, 3 stories, brick and steel, for the Fries-Breslin Co. Bids will not be taken until Jan. 1st.

New York, Auburn. Operations will be started early in February by the Golden Fleece Blanket Co., making California wool blankets. H. C. Nellis, formerly with the Hudson Blanket Co., is superintendent of the plant. G. W. Atwood, formerly of Hudson, is also interested in the plant. They will operate 6 sets cards and 27 looms, also using dye house.

Ontario, Wingham. Work is under way installing machinery for new plant to be started up shortly by J. T. Wood and others as the Brussels Woolen Factory.

*Pennsylvania, Chester. Operations have been started in the Penn Woolen Company's plant, manufacturing wool shoddies. Harvey F. Lamb is treasurer of the company and Harry W. Myers, superintendent. They operate four sets cards. Goods are sold direct.

*Pennsylvania, Chester. Operations have been started up in the Esrey Manufacturing Co.'s mill by Messrs. Murphy & Bro., of Philadelphia. They propose making yarns for the Philadelphia plant. Later they may manufacture other fabrics.

*Pennsylvania, Chester. The Marion Mills Co. have started manufacturing dress goods and men's wear. This plant is equipped with 6 sets cards and 84 looms. Goods are sold direct and through selling agents.

*Pennsylvania, Pittsburg. H. R. Newlin is president of the Pittsburg Woolen Co., recently incorporated with capital stock of $5,000, and R. W. Steele, secretary and treasurer. Worsted waste from all kinds of new clips will be made.

Rhode Island, Woonsocket. Charles Tiberghien and Jean Tiberghien of Charles Tiberghien & Bros., Tourcoing, France, have petitioned the city council for exemption from taxes for 10 years. Same has been granted and work will start soon on erection of $500,000 plant for manufacturing fine worsteds for ladies' wear.

Enlargements and Improvements.

*California, Marysville. The Marysville Woolen Mills will resume operations in the spring on a larger scale. Work has been started clearing the debris of fire, preparatory to erecting new buildings. New and up-to-date machinery will be installed.

Connecticut, South Glastonbury. New twisting machinery is being installed in Franklin Glazier & Son's mill.

Iowa, Des Moines. The Capital City Woolen Mills are installing about $15,000 worth of new machinery in the plant, including looms, dyeing machinery, new water purifier, etc.

*Maine, Kezar Falls. Extensive improvements are under way at the Kezar Falls Woolen Mfg.

Co.'s plant. Work is nearing completion on a new four-story building, 60 by 73 feet, into which the machinery of the old mill will be removed. The old mill is to be torn down and a new addition built on site. The dye house is also being enlarged. Four new sets of cards, several new looms and a new twisting machine for fancy yarns will also be added.

Maine, Westbrook. A new 78-inch boiler is being installed in the Dana Warp Mills.

*Maine, Wilton. The Wilton Woolen Co. has completed installation of 2 sets cards, 2-336 spindle mules and 20 (Crompton & Knowles) looms.

Maine, Winthrop. The Winthrop Mills Co. has recently completed erection of a new brick office building, 32 by 28 feet. They contemplate making extensive alterations and additions in the spring.

Massachusetts, Franklin. The American Woolen Company will soon install new looms and add additional employees at the Ray Mills.

Massachusetts. Holliston. A brick storehouse is to be erected by the Darling Woolen Co.

Massachusetts. Holyoke. The National Felting Company have leased the mill formerly operated by Connor Bros. from the Water Power Company and after alterations are made and additional machinery put in will remove to the newly acquired building. The firm which now employs about 50 people will employ about 75 after starting up in new plant.

*Massachusetts, Holyoke. Contract has been let for the construction of the new stockhouse for the Farr Alpaca Co. This building will be six stories, 120 by 60 feet, and work will start as soon as the old building now on site is removed.

*Massachusetts, Lawrence. The Arlington Mills will manufacture dress goods on the looms installed in the Pemberton Co.'s plant.

Massachusetts, Millbury. The weaving room of the No. 2 mill of the Mayo plant has been closed the past week during installation of new engine.

Massachusetts, Rochdale. Comins & Co. are installing a new picker in their mill.

New Hampshire, Claremont. A 50 h. p. electric motor is to be installed in A. Roberts & Co.'s mill, to assist in power department.

New Hampshire, Guild. The Granite State Mills, Fairbanks & Dorr, proprietors, propose building an addition to the plant during 1905 or 1906.

*New Hampshire, Newport. Dexter Richards & Sons Co. will start work in the spring on the erection of their new mill. They will equip same with 17 sets cards and 91 looms for making shirtings, men's wear. This company is capitalized at $100,000; W. F. Richards is president; S. M. Richards, treasurer; and H. W. Brown, superintendent.

New Hampshire, Rochester. The Rochester Woolen Co. has recently installed two Knowles looms and a Geary lumper.

*New York, Amsterdam. Messrs. McCleary, Wallin & Crouse will remove the spinning machinery they now have in the Axminster Mill to one of the mills recently purchased from the W. H. Rowe Knitting Co. The other buildings will be used for storage.

*Nova Scotia, Amherst. The Hewson Woolen Mills, Limited, have purchased all the additional machinery to be installed. They have increased the plant to 6 sets cards and 30 looms.

Ontario, Athens. J. F. Gordon, proprietor of the Athens Woolen Mill, has purchased the carding and spinning machinery formerly by the Westport (Ont.) Woolen Company and removed same to his mill at Athens.

Ontario, Toronto. The Toronto Carpet Co. has purchased the entire equipment of the Gaffney Carpet Co.'s mill, of Gaffney, S. C., and is removing same here.

Pennsylvania, Landenburg. Mr. Ezra Lund has purchased the plant, which he has been operating for so long. He contemplates making a number of improvements to the mill and machinery.

Pennsylvania, Philadelphia. The Kensington Spinning Co., Huntingdon street and Kensington avenue, is to add two more sets carding and spinning machinery.

Pennsylvania, Philadelphia. The Ellison Mills, which were started in Frankford one year ago as a branch mill of William Ellison & Son, Bradford, England, on dress goods with 100 looms and then shut down owing to the death of Mr. Ellison, are reported to have been leased by the Germania Worsted Mills, who will continue to operate it in conjunction with their plant now in operation at Indiana Avenue and A Street. The latter plant contains 80 wide looms which they run on dress goods. Mr. H. Lonsdale, superintendent and manager of the Ellison Mills, will have charge of the Frankford branch.

Pennsylvania, Philadelphia. The Philadelphia Art Square Manufacturing Co., which has been manufacturing art squares on three looms at Wayne and Bristol Streets, have closed out their business, the equipment of the plant having been purchased by Henry McCauley, Mascher and Jefferson Streets, manufacturer of the same class of carpets. With these three new looms and those which he is already running Mr. McCauley will now operate six looms in all. We learn that he is very busy.

Pennsylvania, Philadelphia. An addition to the second story of the mill occupied by Stinson Bros., Huntingdon and Fairhill Sts., is about to be made at a cost of $10,000 and will be 53 by 186 feet. The firm manufactures tapestry and velvet carpets on 120 looms.

Pennsylvania, Philadelphia. A dry finishing department is to be added to the Persian Mills of which Samuel B. Bunting is the proprietor at 1202 South 12th St., where the manufacture cottons, worsteds and cassimeres on 60 looms. The machinery is now being ordered. C. W. Heritage is the superintendent.

Pennsylvania, Philadelphia. A new two-story office building and show room are to be erected for Charles Porter & Son, Howard & Norris Sts., manufacturers of men's wear and fancy worsted dress goods on 350 looms. The new addition will be 65 by 30 feet.

Rhode Island, Harrisville. Plans have been drawn for a new plant to be erected by the William Tinkham Company and contract will soon be awarded. The building will be 156 by 54 feet, three stories, brick. The company proposes using the new plant for manufacturing woolen and worsted yarns.

*Rhode Island, Harrisville. The new building, 160 by 54 feet, three stories, brick, to be built for the Wm. Tinkham Company, will simply be an addition to the concern's other plants.

*Rhode Island, Oakland. The addition to the Oakland Worsted Mill is nearly completed and help has been working in some of the rooms for the past two weeks. The new building which is 120 by 65 feet, two stories, will be used for weaving and finishing and will have an equipment of 60 looms.

Rhode Island. Pascoag. Plans have been prepared for an addition, 30 by 40 feet, brick, upon which work will start shortly for the Fred L. Sayles Co. The new building, which will be one story, will be used for a picker house. The carding and spinning machinery is being replaced with new.

Rhode Island, Providence. The Atlantic Mills are installing some new machinery in mill No. 1, which it is thought will be devoted entirely to manufacturing yarn, the looms having been removed to mill No. 3.

*Rhode Island, Wakefield. The Wakefield Woolen Co. has recently completed addition of new designing room, 20 by 30 feet, and addition to finishing room 30 by 40 feet. They have also added a new (Knowles) pattern loom and are putting in an electric motor.

Rhode Island, Wakefield. A 50 h. p. electric motor is being installed in the Wakefield Woolen Co.'s plant.

Utah, Provo. The Provo Woolen Company will instal 18 additional looms in the plant for manufacturing fancy cassimeres for men's wear.

Vermont, Ludlow. Extensive additions are to be made to the Verd Mont Mills Company's plant. A new set of cards, a jack and 12 new looms are being installed.

*West Virginia, Martinsburg. The Martinsburg Worsted & Cassimere Co. has completed addition to the main mill and installed 2 sets 60-inch cards and spinning machinery for manufacturing its own wool-spun yarns. A two-story wing is also under way and will soon be completed.

Mills Starting Up.

New Hampshire, Hillsboro Bridge. The Hillsboro Woolen Mills are about to resume operations in the plant after shut down of several months. During the idleness a new dyehouse has been built and other improvements made.

*New Hampshire, Keene. Faulkner & Colony's woolen mills have resumed operations, the new dye house, picker room extension, etc., having been completed. The capacity of the plant has been materially increased.

New York. Schaghticoke. The Schaghticoke Woolen Mill will soon have the plant in active operation.

*Pennsylvania, Chambersburg. Operations have been resumed in the Chambersburg Woolen Mill on a limited scale. It is thought the plant will be running to its full capacity before long.

*Rhode Island, Bristol. The Namquit Worsted Mill is now running on worsted goods.

*Rhode Island, Woonsocket. The Alsace Worsted Company has begun operations in their new mill, although the full equipment has not yet been installed. Make fine worsted yarns, using Belgian process.

Mills Shutting Down.

Maine, Princeton. S. L. Peabody's woolen mill has been closed for the winter.

New Brunswick, Woodstock. The Carleton Woolen Mill Co. is to close the mill, the present owners desiring to discontinue business. Unless the property is sold it will never be operated again.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

*Massachusetts. Farnumsville. The new wheel has been installed in the Farnumsville Mill to be operated as a silk plant and the mill is now ready for installation of machinery.

New Jersey, Paterson. A new concern has been started in the Piaget Mill, on Godwin Street, by Jacques & Hantson, weaving broad silks.

*New Jersey, Paterson. The Threlfall Steele & Lucas Co., Inc., reported organized with capital stock of $25,000, operate 42 looms on tie silks. William Threlfall is president of the company; Wm. C. Lucas, treasurer and John Steele, agent. Wm. C. Lucas, dept. Schefer, Schramm & Vogel, N. Y., is selling agent.

New Jersey, Paterson. The Collins & Rosendale Co. has been incorporated with capital stock of $25,000 by Peter Collins, Jennie Collins and Ryan and Emma Rosendale. They will manufacture silks.

New Jersey, Paterson. The American Silk Weaving Company has been incorporated with capital stock of $20,000. The plant is to be located in the Essex Mill. Jacob Katz and Monroe Brubaker are among the incorporators.

Pennsylvania, Philadelphia. A small plant for the manufacture of woven silk labels for the hat trade is being operated by Charles E. Brown, who is running 6 jacquard looms at 313-15 Race Street and selling hs production direct. He buys taffeta slk only.

Pennsylvania, Philadelphia. The International Silk Company, with a capital of $25,000, has just received its charter from Harrisburg. It is not known where the company will start its operations.

Rhode Island, Providence. The Nashawena Silk Mills have been incorporated with capital stock

of $125,000. Wm. B. Edgar is president of the company and Raymond D. Borden, treasurer. A plant is to be erected in the south, but at present are not ready to give details.

Enlargements and Improvements.

Connecticut, Putnam. John E. Knowlton's dyeing establishment has been sold to the Hampton Silk Company.

Connecticut, Putnam. An addition is to be erected to the John A. Dady Corporation's plant.

Connecticut, Watertown. The Heminway & Bartlett Silk Company, which is building an addition to the plant, has increased the capital stock from $75,000 to $150,000.

Connecticut. Willimantic. The Windham Silk Company has installed two new looms for manufacturing silk dress goods, 36 inches wide, giving total of 135 looms in the plant.

New Hampshire, Dover. Work has been started on erection of an addition to the Cocheco Manufacturing Company's new velvet mill.

New Jersey, Rahway. Plans are being prepared for a new mill to be erected for Degener & Steiner, manufacturers of plush. It is thought that construction work will start in the spring. The new mill will be equipped with 60 looms.

Pennsylvania, Altoona. Preparations are being made for putting the whole of the Altoona Silk Mill's plant in operation. A large amount of new machinery will be installed in the plant when extensive improvements to the old building on Ninth Ave. are completed.

Pennsylvania, Philadelphia. Joseph Loeb, of the firm of Loeb, Lipper & Co., manufacturers of dress, millinery trimmings and braids on 100 looms, 1,000 braiders and 50 knitters, at 317 to 321 North Darien street, has purchased the adjoining properties at 323 to 329 Darien street, for $10,500. On this site an addition to their factory will be erected which will be six stories high, covering an area 54.6 by 112 feet. Construction will start early in the coming spring.

Pennsylvania, Philadelphia. The Germantown Textile Company, 79 Wister St., Germantown, operating 8 looms and other machinery on silk and cotton upholstery fabrics, has been consolidated with the Vigilant Mills, of Leiper & Adams Sts., Frankford, to which address the machinery will be removed and again be put into operation.

Pennsylvania. Scranton. An addition is being built to the Ashley Silk Mill to be used for storing raw materials. Several new machines have also been put in the plant.

Mills Starting Up.

*Pennsylvania, New Holland. The New Holland Silk Mill, which has been idle for some time, has been started up as the S. & S. Silk Mill. James A. Gilfillan is superintendent of the mill. Goods are sold through J. A. Ulrich, dept., H. A. Caesar & Co., N. Y. There are 110 looms in the plant.

Mills Shutting Down.

*New Jersey. Summit. The Summit Silk Mill has been closed for an indefinite time.

MISCELLANEOUS.

New Mills.

Georgia, Decatur. The Georgia Cordage Mills is a new concern recently started, manufacturing cotton thread, rope and twine. Plant is equipped with 2,000 spindles and operated by steam. C. M. Candler is president and treasurer of the company and R. L. Stubbs, superintendent. Goods are sold through J. Spencer Turner & Co., N. Y., and direct.

*Massachusetts. Methuen. Work has been started on construction of new building for the Tekcips Dyeing, Weaving & Finishing Co. The main building will be 70 by 42 feet, two stories with dyehouse 50 by 42 feet, one story, and boiler house 40 by 30 feet.

*New York, Binghamton. The Binghamton Linen Mills, incorporated with capital stock of $80,000, will start operations about January, 1905, making linen and Union towels and crashes. W. H. Wilkinson is president of the company; W. M. Sharp, treasurer, and L. W. Johnson, general manager. Plant will be equipped with 500 flax spindles and 40 looms and operated by steam.

Enlargements and Improvements.

*Massachusetts, Millbury. The mason work has been finished on the new addition to be built for the West End Thread Mill. They contemplate having the machinery installed and addition ready to start operations early in the year. The building will be 200 feet long, two and one-half stories high.

Massachusetts, Webster. Repairs are being made to the Stevens Linen Works, during which time the plant is not running.

Pennsylvania, Philadelphia. J. Bray, hosiery printer, who until recently was located at Mascher and Oxford Streets, has removed to the rear of 2042-44 Fletcher St., where he is occupying the three-story building formerly used as a carpet factory. Mr. Bray reports that he is very busy printing new designs on hosiery and that the building now occupied by him is not large enough to enable him to get out the large amount of orders on hand. He is contemplating the adding of new features to his business in which event it will be necessary for him to take in the building adjoining the one which he now occupies.

Mills Starting Up.

Pennsylvania, Easton. The Easton Cordage Co. has resumed operations, after two weeks' shut down, for purpose of making repairs and enlargements to the works. A new boiler plant has also been built.

Personals.

Cotton.

A. L. Connors, who has been secondhand in the cloth room of the Blackstone Mfg. Co., Blackstone, Mass., has resigned to take a position as overseer in the Nottingham Mill at Providence, R. I.

J. A. Knight, formerly of Taunton, Mass., has gone to New Bedford, being the new superintendent of the Bristol Mills. He was formerly assistant superintendent of the New England Cotton Yarn Co.

John F. Minnick has resigned as overseer of weaving at the Warren Cotton Mills, Warren, Mass.

Joseph Butler has retired as overseer of the fulling department of the Atlantic Mills, Providence, R. I.

W. O. Tallant, formerly of La Grange, Ga., has gone to Thomaston, Ga., where he will have charge of carding and spinning.

Thomas Garlick has secured the position of overseer of carding at the Seaconnet Mills, Fall River, Mass.

William Tallant, who has had charge of the weaving department of the Salmon Falls Mfg. Co., Salmon Falls, N. H., has severed his connection with that company. Mr. Tallant has secured a position in Massachusetts.

Harvey Merrill, the retiring superintendent of the Sanarac Mill, Blackstone, Mass., was presented by the help in the mill with a horseshoe pin, containing 19 diamonds.

Alphonse B. Lavalle, boss slasher at the Globe Mill, Woonsocket, R. I., has resigned. William Hall of Fall River succeeds him.

David J. Price has resigned as overseer of weaving, warping and slashing departments of the Totokett Mills of Norwich, Conn. Before leaving, Mr. Price was presented with a gold watch and chain and scarf pin by the help.

W. B. Bruton and family have left for Gaffney, S. C., where Mr. Bruton will have the superintendency of the Gaffney Manufacturing Company. He has recently been engaged starting the Manetta Blanket Factory at Lando, S. C.

A. J. Pray of Chicopee is the new boss weaver in the Danielson Cotton Mills, Danielsonville, Conn.

Frederick W. Harley, who has been superintendent and also a director of the Barnaby Mills, Fall River, Mass., has been appointed treasurer, to succeed Treasurer Mason, resigned.

J. G. Wardlaw, secretary of the Orient Mfg. Co., Charlotte, N. C., succeeds H. D. Wheat as president of the mill, and will take personal supervision of it. Mr. Wheat resigns to give more attention to the Gaffney (S. C.) Mfg. Co., of which he is also president and treasurer. Mr. Wardlaw is also secretary of the Gaffney Company, and was stationed here prior to the change.

Henry McDermott of Washington, Miss., has gone to Brenham, Texas, to take the position of superintendent of the Brenham Cotton Mills, succeeding Mr. Pender, who has been superintendent since it started up.

Fred Martin, formerly of Prattville, Ala., but recently in charge of a cotton mill at Athens, Ala., has accepted the superintendency of the Highland Mills at Talladega, Ala.

D. B. League has been appointed superintendent of the Arkwright Mills, Spartanburg, S. C., to succeed K. McGowan, recently resigned. Mr. League for several years had charge of the weave room of the mill. J. C. Montjoy now has charge of this department.

Gilbert Broome has resigned his position as assistant superintendent of the Bennett Mill, New Bedford, Mass., to accept a position as superintendent in New York State. John J. McMullen, at present overseer at the Bennett Mill, will succeed Mr. Broome, and Hugh J. Gourley will be Mr. McMullen's successor.

At a meeting of the directors of the Davis Mills, Fall River, Mass., J. Bion Richards tendered his resignation as treasurer and it was accepted. Edward Barker, of the firm of Flint & Barker, furniture dealers in Fall River and Worcester, has been elected as his successor, and has assumed charge. Mr. Barker is considered an able business man, having had a wide financial experience.

J. C. Martin has accepted the position of overseer of warping and spooling at the Olympia Mills, Columbia, S. C.

W. J. Thompson, who has been for 13 years superintendent of the Holt-Granite Mills at Haw River, N. C., has been appointed general superintendent of the new Erwin Mill at Duke.

W. R. McGregor, formerly with Eagle & Phenix Mills, Columbus, Ga., has accepted a position as designer and assistant superintendent with the Mississippi Mills, Wesson, Miss.

Adnah W. Ham, for 25 years connected with the Atlantic Mills, Providence, R. I., in responsible positions, has severed his connection with the plant. The position he last held, that of purchasing agent, has been abolished.

A. F. Brown is now superintendent of the Orangeburg Mfg. Co., Orangeburg, S. C. He was formerly overseer of carding at Laurens, S. C.

Ira F. Phillips, late overseer of the City Mills, New Bedford, Mass., has been appointed overseer of the New England Cotton Yarn Mills, Nos. 11 and 12 of Taunton.

J. A. Knight of Taunton, Mass., has been appointed superintendent of the Bristol Mfg. Co., New Bedford, Mass., to succeed L. W. Powers, who has gone to Utica, N. Y.

Henry McDermott is the new superintendent of the Brenham Cotton Mills, Brenham, Texas, succeeding C. A. Pender, resigned.

J. B. Loflin, superintendent of the Gluck Mills, Anderson, S. C., since its organization, has resigned.

The Pelzer Manufacturing Company, Pelzer, S. C., are increasing their system of humidifiers, using the American Moistening Company's system.

James W. Taylor, for a number of years superintendent of the Canoe River Mills, and who recently went to Muskegon, Mich., to start up the cotton spinning department of the Amazon Knitting Co., has completed his task and will soon return East.

Woolen.

E. Thornton, who for the past year has been at the Wakefield Mill, has accepted a position as boss dyer in the mill of the American Woolen Company, Maynard, Mass.

John G. Robinson is now boss carder for the Allen Woolen Mills, Rochester, N. Y.

William Collins, who succeeded William Kerwin as superintendent of the woolen department at the Atlantic Mills, Olneyville, R. I., will retire.

Frank Collins, who has for a number of years had charge of the speeders and twisting room of the Peace Dale Mfg. Co., Peace Dale, R. I., has resigned to accept a position in Fitchburg, Mass.

William Daily, who was boss dyer for the Clinton Worsted Co., Clinton, Mass., and who moved to Pawtucket, R. I., when the plant shut down, has returned to the town and entered the employ of the Nashua Valley Mills.

S. J. McIntyre, for many years boss carder for the Globe Woolen Co., Utica, N. Y., has taken the same position at the Oneko Woolen Mills, New Bedford, Mass.

L. H. Gammage, formerly with the Dunn Worsted Co., Woonsocket, R. I., is now designer at the Namquit Worsted Mills, Bristol, R. I.

Charles Comrod, late of Norwich, Conn., is the new overseer of picking at the Hallville (Conn.) Mill.

Howard G. Beaman has accepted a position as designer in the Fitchburg Worsted Mills, Fitchburg, Mass.

C. W. Radcliffe has severed his connection with the Rivulet Mill, Uxbridge, Mass., where he has been acting as superintendent for the past few months.

William J. Mahoney, formerly of North Adams, is overseer of spinning at the Blackinton Woolen Co., Blackinton, Mass.

Edmund Griffin, who has been in charge of the dyeing department in No. 1 mill of the Dunn Worsted Company, Woonsocket, R. I., has been appointed overseer of dyeing in No. 2 mill, succeeding William R. Dalley, who has accepted a similar position in Clinton, Mass. Mr. Griffin now has charge of the entire dyeing department of the mills.

John L. Seaver, for the past three years employed in the office of the Washington Mills plant of the American Woolen Co., Lawrence, Mass., has resigned and has gone to Fairfield, Me., to take the position of paymaster of the Kennebec Mills, owned by the same company.

Frank P. Cook, of Salem, for several years assistant engineer at the Salem Electric Light Station, has gone to Amesbury, where he is chief engineer of the Amesbury Woolen Mills' plant.

William Battie is the new designer at Graham Clark & Co.'s mill at Adams, Mass. Mr. Battie comes from Wales.

Ephraim Hodgdon, for many years secretary, treasurer and superintendent of the Newichawanick Co., South Berwick, Me., has retired from the active management, and been succeeded by J. T. Brown, who has been connected with this company for 33 years.

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C. B. Miller Sprowles, president of the Standard Machine Company, Philadelphia, died at his home in Frankford, December 26th, after an illness of six months. Mr. Sprowles was born in July, 1849, received a fair common school education and served an apprenticeship at the machine trade and tool making. Becoming very proficient at this trade, being an expert at tool making, he went into the machinery business in partnership with his cousin, John Miller, and at his death formed the partnership of Sprowles & Houseman, which continued until the death of Mr. Houseman. This concern were in the machine manufacturing business in a general way until the inventions of H. A. Houseman gave to the hosiery manufacturers the Standard automatic knitter, and from that time Mr. Sprowles became prominently identified with the knitting interests throughout this country and abroad. It was principally through his efforts that the Standard Machine Company was formed, and shortly after the death of his partner, Mr. Houseman, he closed out his interests in the firm of Sprowles & Houseman, and devoted his entire attention toward promoting the welfare of this company. He was well and favorably known to all of the prominent hosiery manufacturers in this country, and his family life was ideal. Three sons and four daughters, besides his wife, survive him.

The death of Joseph Nasmith, the editor of The Textile Recorder, of Manchester, England, occurred on December 8, 1904, after an illness of but a few days. He had not been in good health for two years, but his death, which resulted from cerebral hemorrhage, was unexpected. Mr. Nasmith was born in 1848 and studied at the old Mechanic's Institute in Manchester, serving his time as an engineer with Wren & Hopkins of that city. Later he went to H. M. Dock Yard at Portsmouth, subsequently visited Australia and on returning to England took service with Joseph Stubbs, a textile machinist in Manchester. Mr. Nasmith had served as managing director of Meters Ltd. since its formation and was a director in several other successful companies. He was perhaps better known to the textile trade of America as the author of "Modern Cotton Spinning Machinery" and "The Student's Cotton Spinning," and as editor of The Textile Recorder. He was a member of the Institute of Mechanical Engineers, of the Technical Instruction Committee in connection with the Manchester School of Technology and examiner on textile subjects for the City Guilds Institute, London. His death is a source of sorrow to a large number of friends and a distinct loss to the textile trade.

J. B. Loflin, superintendent of the Gluck Mills, Anderson, S. C., since its organization, has resigned.

The Pelzer Manufacturing Company, Pelzer, S. C., are increasing their system of humidifiers, using the American Moistening Company's system.

James W. Taylor, for a number of years superintendent of the Canoe River Mills, and who recently went to Muskegon, Mich., to start up the cotton spinning department of the Amazon Knitting Co., has completed his task and will soon return East.

Woolen.

E. Thornton, who for the past year has been at the Wakefield Mill, has accepted a position as boss dyer in the mill of the American Woolen Company, Maynard, Mass.

John G. Robinson is now boss carder for the Allen Woolen Mills, Rochester, N. Y.

William Collins, who succeeded William Kerwin as superintendent of the woolen department at the Atlantic Mills, Olneyville, R. I., will retire.

Frank Collins, who has for a number of years had charge of the speeders and twisting room of the Peace Dale Mfg. Co., Peace Dale, R. I., has resigned to accept a position in Fitchburg, Mass.

William Daily, who was boss dyer for the Clinton Worsted Co., Clinton, Mass., and who moved to Pawtucket, R. I., when the plant shut down, has returned to the town and entered the employ of the Nashua Valley Mills.

S. J. McIntyre, for many years boss carder for the Globe Woolen Co., Utica, N. Y., has taken the same position at the Oneko Woolen Mills, New Bedford, Mass.

L. H. Gammage, formerly with the Dunn Worsted Co., Woonsocket, R. I., is now designer at the Namquit Worsted Mills, Bristol, R. I.

Charles Comrod, late of Norwich, Conn., is the new overseer of picking at the Hallville (Conn.) Mill.

Howard G. Beaman has accepted a position as designer in the Fitchburg Worsted Mills, Fitchburg, Mass.

C. W. Radcliffe has severed his connection with the Rivulet Mill, Uxbridge, Mass., where he has been acting as superintendent for the past few months.

William J. Mahoney, formerly of North Adams, is overseer of spinning at the Blackinton Woolen Co., Blackinton, Mass.

Edmund Griffin, who has been in charge of the dyeing department in No. 1 mill of the Dunn Worsted Company, Woonsocket, R. I., has been appointed overseer of dyeing in No. 2 mill, succeeding William R. Dalley, who has accepted a similar position in Clinton, Mass. Mr. Griffin now has charge of the entire dyeing department of the mills.

John L. Seaver, for the past three years employed in the office of the Washington Mills plant of the American Woolen Co., Lawrence, Mass., has resigned and has gone to Fairfield, Me., to take the position of paymaster of the Kennebec Mills, owned by the same company.

Frank P. Cook, of Salem, for several years assistant engineer at the Salem Electric Light Station, has gone to Amesbury, where he is chief engineer of the Amesbury Woolen Mills' plant.

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New Publications.

Objections to Reciprocity; by William Whitman. Published by the Author.

Man has been defined as the only animal that buys and sells. All trade from barter to the commercial transactions of the present time, is based on reciprocity, by which each receives what he wants in exchange for something of which he has less need. Such exchange between individuals is an instinctive human trait. Reciprocity as applied to trade between two nations means the lowering of duties by each on the imports from the other, the concessions of one balancing those of the other. If one party to such a treaty gives more than he receives, the arrangement ceases to be reciprocal and instead becomes preferential. In trade, reciprocity is justice; preference is injustice. All favor the former; only those who are unduly benefited, the latter. A clear idea of this distinction between preferential and reciprocal trade arrangements will prevent many errors arising from a confusion of terms. As accomplished by treaty under our system of government, reciprocity is the Golden Rule made mutually effective by and with the advice and consent of the Senate.

In trade between individuals the reciprocal exchange is made with but a single interest on each side. In international trade it is necessary to select the products of certain industries on which the duties are to be lowered, while all other industries remain unaffected. This is what makes the practical application of reciprocity to international trade so difficult. The industries of each nation are like a lot of turtles with heads and legs eagerly extended to welcome the advantages without bearing the burdens of reciprocity. But if one is tapped on the back and called upon to make some sacrifice, head and legs are drawn in with a jerk and the shell marks the end of reciprocity. This is natural because reciprocity and justice between nations may become discrimination and injustice to the individual. Moreover, the difference between the buying and selling capacity of different countries must be considered in striking a balance of reciprocal concessions. These obstacles enhanced by national rivalries and jealousies make reciprocity between independent States always difficult and generally impossible. The most effective means of establishing a reciprocal trade is an effacement of conflicting interests by consolidation. The greatest reciprocity treaty ever enacted is the clause in the Constitution of the United States that "no State shall, without the consent of Congress, lay any imposts or duties on imports or exports."

In view of the great difficulty of accomplishing reciprocity, the opinions of a manufacturer as successful and prominent as Mr. Whitman are of more than usual interest. He has presented his opinions in a pamphlet and with commendable fairness has invited criticism in order that "if he has not made his position good" he may be corrected. This is the attitude of a man who is so firmly convinced he is right that he has no fear of having opposing opinions stated.

In the pamphlet he shows no favor to reciprocity as a practical proposition. His first objection is that reciprocity treaties are unconstitutional. To support this contention quotations are made from many authorities, including Justin S. Morrill, Rufus Choate, old English law, John Randolph, Dr. Ernest Meyer, Professor of Law in the University of Halle, Germany, Lord Auckland, McCulloch's Commercial Dictionary, Grover Cleveland's first message and Washington's farewell address.

Evidently realizing that in the absence of a Supreme Court decision and in the presence of four reciprocity treaties in operation, even this array of authorities would not settle the constitutional question, the author addresses himself to other considerations. He points out that tariff concessions to a country of high protection like France and Germany, would be unfair to free trade countries like Great Britain and Holland, and would invite reprisals from the last named. He condemns reciprocity as free trade in disguise, citing the admissions of Thomas A. Hendricks and Henry Fawcett to this effect, and is much opposed to the secret methods by which the tariff schedules would be rearranged through diplomatic negotiations.

After outlining the general principles of foreign and domestic supply and demand, the author calls attention to the satisfactory state of our foreign trade, which has doubled since 1879, the exports exceeding those of any other nation. The next objection to be raised is the lack of any popular desire for reciprocity.

The pamphlet concludes with a section entitled "Experience against Reciprocity," which is evidently offered as conclusive. The countries with which the United States have concluded reciprocity treaties are taken up in turn and the total exports of all kinds of goods to each are given for the year before the treaty went into effect, for the first year under the reciprocal arrangement, and for the year after the treaty expired. It is difficult to conceive anything more fallacious and misleading than to judge of reciprocity by an examination of the total exports of all commodities to a country rceiving but a few articles from us at reduced rates. It is like judging of the efficiency of a single machine in a large mill by the total product of the mill before and after the machine was installed, an error which the author of this pamphlet would be the last to make. Take the German treaty of 1892, for example. By it Germany agreed to admit either free or at reduced rates forty-one commodities from the United States. Our total exports of all kinds to Germany in 1892, the year before the treaty, amounted to $105,521,558; in the first year under the treaty to $83,578,988; and in the year after the treaty expired to $92,053,753. Mr. Whitman holds these figures up triumphantly as a "startling exhibit," proving the failure of reciprocity under a treaty by which Germany admitted under a nominal reduction of tariff rates a limited number of American products among which are found beehives with live bees, bran, flax, feathers, hides, skins, horsehair, charcoal, pigs weighing less than 10 kilograms (22 pounds), bulls, cows, colts following the dam, wool and goose grease.

Having adopted a fundamentally wrong principle in drawing conclusions from these statistics, the author falls into equally grave errors in matters of detail. He omits any reference to the ef-

fects of the panic of 1857 and of the Civil War on the trade with Canada under the reciprocal trade arrangement from 1855 to 1868; ascribes to "exceptional conditions" the increase of exports to Hawaii from $779,257 in 1876, the year before the reciprocity treaty, to $13,509,148 in 1900, the last year under the treaty; and takes little notice of Cuba and Porto Rico where his own misleading figures support reciprocity. The other countries cited are Guatemala, Honduras, Nicaragua, Salvador, British West Indies, Santo Domingo, Brazil, British Guiana, and Austria. The statistics, even from the author's fallacious standpoint, indicate little if anything for or against reciprocity and deserve no consideration because this part of the argument is based on the error of taking a part for the whole.

This pamphlet has been issued in the "hope that it will contribute to a fuller discussion of the question in all its bearings." We are confident that no one will recognize more quickly than its author the errors we have pointed out, which, nevertheless, suggests a valuable field for investigation. What effect have our various reciprocity treaties had upon the exports of the commodities affected? Not only the total exports of such commodities, but the amount of each should be given. How many American colts followed their dams to Germany before, during and after the treaty of 1892.

In the meantime we can withhold judgment on past treaties and judge each new proposition by itself. If it is truly reciprocal and otherwise unobjectionable it can be accepted. If preferential and likely to injure any American industry, as the British preference has destroyed the woolen industry in Canada, it will most certainly be rejected.

Textile Analysis and Calculation (Die Materialbestimmungen und die Kalkulationen der Gewebe); by Hermann Dornig, Overseer of Weaving, Greiz, Germany; price $2.00.

A practical hand book for German textile mills. It is compiled with unusual care and thoroughness, and the author has eliminated discussion of theory, which so often impairs the usefulness of such books. This work, however, exhibits the usual confusion of German weights and measures, a fault for which the author is in no way responsible. He, in fact, protests vigorously against this chaos in which custom forces him to work. He begins the chapter entitled "Diversi" by saying: "In response to many requests I give the following data which will be useful so long as the metric system is not completely introduced" (into Germany). This is followed by the usual heterogeneous collection of ells, inches, pounds, and systems of yarn numbering which, 34 years after the adoption of the metric system, make a chaos of German textile work, and with which our readers are already familiar.

In another part of the book Herr Dornig says: "The metric system of numbering cotton yarn, which is warmly advocated, has, like all new things, few friends and many enemies. It is really laughable that we should cling to the antiquated, wholly out of date, unpronounceable yard standard, while France, Germany and Austria have introduced the meter."

Again, speaking of the plan to introduce the metric system into the German textile industry, he says: "Three days is enough and then common sense would force people to demand the real, exact, practical, metric yarn system from spinners and dealers. Do people suppose that the yarn dealers will adopt the metric system in order that they may lose the "effective" standards, and that the fancy yarn dyers shall no longer be able to trade in yarn reeled from 26 to 24 and from 36 to 32? Pshaw! That is superstition. No one will do this of his own accord. . . . . All countries have learned that the passage from old to new is attained by the word 'Must.'"

The book begins with a very good chapter on distinguishing fibres. This is followed by the analysis of fabrics, estimating cost and general calculations, treated in a practical manner to make the book useful in mill work. The text is in German.

Cotton Yarn Manufacture; by William E. Winchester; Philadelphia Textile School; 3 vols. Price $2.00 each.

This book has been written to supply the need for a handbook adapted for American practice in the manufacture of cotton yarn. Although many excellent books on this subject have already been published in English, nearly all are based on English practice. The first chapter of this work treats of the varieties and classifications of cotton, which is followed by chapters on cotton ginning and baling, preparatory processes and machines, carding and drawing, fly frames, spinning and twisting, preparation of yarn for market, organization, heat and moisture.

Each division of the subject is treated in detail and the text is illustrated with many excellent drawings. The work is used as a text book in the Philadelphia Textile School.

Cotton Spinning (Filatura del Cotone); by G. Beltrami; Ulrico Hoepli, Milan, Italy. Price $2.50.

The growth of textile literature in Italian is a natural accompaniment to the rapid development of the textile industry in Italy during recent years. The present work treats of cotton spinning only, this being the branch in which the greatest progress has been made. It is of convenient size, 4 by 6 inches, and illustrated with 196 engravings. There are 41 tables, many of which, unfortunately, are made necessary by the different standards of weight and measure in Italy, including the English and the metric. The subject of cotton spinning is very carefully treated in the 537 pages of the work, beginning with a chapter on the cotton fibre and taking up each process of manufacturing yarn.

Handbook of Weaving (Handbuch der Weberei); Parts I and II; Nicholas Reiser; Arthur Felix, Leipzig, Germany. Price of each part, $1.25.

We have received the first and second parts of this work, which is to be completed in eleven instalments. The first two parts contain the beginning of what will be a very thorough exposition of the general principles and details of weave construction. The work is freely illustrated with excellent diagrams and the descriptive matter is of the same high character, being brief, clear and to the point. One chapter is devoted to the analysis of fabrics and the various systems of weight and measure in use in Germany. The text is in German.

Business Literature.

A Few Loose Ends; Clemson Textile School, Clemson College, S. C.

A leaflet calling attention to the textile department of the college at Clemson College, S. C.

Pumping Machinery; Henry R. Worthington, New York City.

An elaborate catalogue of the Worthington pumps and condensers and water meters. The apparatus described in this pamphlet comprises the many types of pumping and measuring devices developed by this company in the 64 years of its existence.

A B C Vertical Engines; American Blower Co., Detroit, Mich.

An illustrated catalogue of the various types of the vertical engines built by this well known concern.

Steam Trap Installation.

E. F. Houghton & Co., of Philadelphia, Chicago and Detroit, have issued a new catalogue illustrating the various methods of installing the Marck steam trap, which will be mailed free of charge to anyone writing to their Philadelphia address, 240 W. Somerset St. It is interesting reading to anyone engaged in the economical use of steam, the prevention of freezing of steam pipes or the obtaining of a uniform heat at a minimum pressure.

Cotton Facts; by A. B. Shepperson, New York City.

This publication comes around with the regularity of the seasons, and the latest edition, just received, contains the usual amount of information together with such additions as are necessary to bring it up to date. A copy of it should be in the possession of every one connected with the textile trade.

A Lubrication Number. The Joseph Dixon Crucible Company begins the new year with a special issue of their monthly house publication "Graphite," devoted to graphite lubrication. This number has been sent to thousands who are vitally interested in lubrication in the hope of leading to a better understanding of the principles underlying the most effective use of Dixon's Ticonderoga flake graphite.

Calendars.

G. Drouve Company, Bridgeport, Conn., manufacturers of cornices, skylights, finials, etc.

A calendar particularly suitable for offices, the figures being large and clear and not interfered with by any advertising matter. The upper half of the calendar is devoted to a representation of the wares that they manufacture. A copy of this calendar will be sent upon request to any one mentioning this publication.

The Bourse, Philadelphia, Pa.

An engagement pad for the wall or desk sent out by The Bourse, and conveying their compliments and best wishes.

Year 1905; McKenney & Waterbury Co., Boston, Mass.

This is the imprint in gold letters on a petite calendar and stamp case bound in green leather that this firm is sending out to its friends. Accompanying it is a written note in which they extend hopeful greetings and best wishes for the new year.

C. Scott Althouse, Chemist, Philadelphia, Pa., through his manager, Charles H. Heyer, is sending out to the trade a particularly neat desk calendar and thermometer.

Pennsylvania Fire; The Pennsylvania Fire Insurance Co., Philadelphia, Pa.

This insurance company, which has been so well and favorably known since its incorporation in 1823, and whose New England office is in charge of Henry D. Bennett, 75 Kilby St., Boston, is sending out an attractive office calendar of large size and printed in clear type.

Phenix Fire Insurance Co., Brooklyn, N. Y. T. W. Penhallow, New England Agent, 53 State St., Boston, Mass.

A good businesslike calendar for office use.

The Whitin Machine Works, Whitinsville, Mass.

A large sized calendar printed in colors is being sent to the trade by these builders of cotton machinery.

Asti Head; Thomas H. Ball, Philadelphia, Pa.

This is the subject of a large office calendar sent out by this well known dealer in worsted yarns, and bearing a lithographed reproduction of one of the celebrated "Asti" heads.

"An Old Sport;" The S. J. Corey Co., Dyestuffs and Chemicals, Boston, Mass.

An attractive calendar in holiday red with a half tone reproduction of a bull dog so ugly that he is handsome, the "Old Sport" of Fairman's painting.

Birch Brothers Company, Somerville, Mass., Albert Birch, Manager.

This well-known company, builders of textile finishing machinery, has sent us a very attractive calendar in black and white.

Speed & Stephenson, Textile Machinery and Supplies, Boston, Mass.

The friends of these well- known dealers in textile machinery and supplies are receiving a particularly pleasing calendar showing the photograph of a young girl.

The Wisconsin Mfg. Co., Two Rivers, Wis.

These enterprising manufacturers of hosiery boards, dye boards, glove and mitten forms, etc., are sending out a unique calendar in the form of a miniature hosiery board. It is also an excellent advertisement, as it shows the material and workmanship of their products.

Federal Trust Co., Boston, Mass.

An office calendar appropriately printed in red and blue and bearing a representation of Uncle Sam and Columbia, who is pointing out the White House to a schoolboy as a goal to be kept in view.

An Important Electric Announcement.

The National Electric Company, of Milwaukee, have entered into an important arrangement with Robert Lundell and Robert T. Lozier, by which the National Company will manufacture and market the new motors and generators, and systems of operation and control that are covered by the latest inventions of Robert Lundell, the commercial direction of the undertaking being placed in the hands of Robert Lozier, who will also act as general manager of the electrical sales department of the National Company. Under this arrangement Mr. Lundell assumes the direct supervision of the engineering involved under the license that he grants the National Company. It might be said that this license covers all of Mr. Lundell's inventions not already under license to other companies, and all inventions that he may hereafter make during the life of this license.

These inventions of Mr. Lundell are of particular interest to the trade, in that they cover important developments in direct current apparatus. Some of these patents are for a new type of motor and dynamo frame construction as well as a new method of commutation, by which a material gain is obtained in the space occupied by the apparatus, its efficiency, and the flexibility of its speed control and regulation.

This form of construction represents an important departure in standard motors of fixed speed, and is particularly advantageous in variable speed motors for direct application to machinery, both from point of construction and flexibility of control. These Lundell inventions are equally valuable in systems of regenerative operation and series parallel control and to the numerous other uses to which electric motors are now so generally applied, among which can be prominently named electric railways, electric elevators and electric automobiles. The whole group of patents are comprehensive in their scope; they cover a new type of machine construction, new principles of commutation and new methods of operation, based upon Mr. Lundell's long and varied experience in the direct current field, in which Mr. Lundell has won fame and distinction, his apparatus being now largely used not only in this country, but throughout the other countries of the world. It might be said that the Johnson-Lundell Traction Co. of England, has been organized to manufacture under these patents in Great Britain and elsewhere abroad.

As to the commercial significance of this new arrangement, the field to which Mr. Lundell's inventions particularly apply is one of the broadest and best established in the business. It is a field with which Mr. Lozier has been associated from the earliest commercial development of the electrical motor, he having been placed in the testing department of the Sprague factory when it was started in West 30th St., in 1887, when the first commercial electric motors were developed, and has since followed the development of the business in all its phases. It was in this shop that Lozier first met Lundell and formed a friendship that has developed into the alliance consummated by the arrangement with the National Company. In the 17 years that have followed, each has had the opportunity of maturing in his experience in his own special line, and now their conjunction with the National Company's splendid manufacturing facilities and high commercial standing completes an advent of considerable significance to the trade and to the art.

The National Electric Company, of Milwaukee, formerly operating under the style of Christensen Engineering Co., have in the past seven years equipped the majority of the electric cars using air brakes.

Four years ago they built their present plant, abundantly equipped it with the best tools and labor saving machinery. A foundry having open hearth and crucible furnaces for making steel castings, also cupolas for gray cast iron, and a complete brass foundry as well. The plant has all the other features necessary to make it one of the most comprehensive and up-to-date plants to be found in the electrical manufacturing business.

The success met with in the air brake business encouraged those financially back of the National Company to enter into the general field of electrical machinery, and two years ago a competent engineering corps under the able direction of Mr. W. L. Waters, Chief Engineer of the National Electric Co., and an active sales organization was put into operation, and the results of this work have in turn been so thoroughly successful that the National Company has now decided to follow up the material gain already made, with a view to developing this branch of their business to its fullest capacity, and to this end have established a separate electrical department.

Mr. Lozier will be aided in directing the work of that department by his long experience in the electrical field. Beginning with Edison early in '83 and running down through the engineering and commercial branches of the business for 13 years with the General Electric Company, for the last 8 years having devoted his time to marketing the apparatus of the Bullock Electric Mfg. Co.

Mr. Samuel Watkins is the President of the National Company. He organized it, and under his able direction the Company has reached its present prominence.

Mr. Bernard T. Becker, who represents the interests of those financially back of the company, and who is himself a large stockholder and a director in the company, will act in an executive capacity in connection with the operation of the company.

The First Vice-President and General Manager of the National Electric Company, Mr. Frank C. Randall, is widely known throughout the electric street railway field, and the air brake sales will continue as in the past, under his direct charge.

Of the operative force, R. P. Tell is the secretary and treasurer. J. H. Denton, well known to all those who come in contact with the air brake business, is the general superintendent.

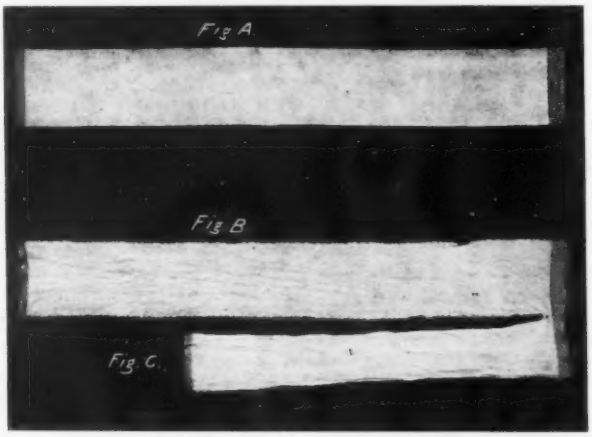
The Westinghouse Company's Mexican Contract.

The Westinghouse Electric & Manufacturing Company, through their agents, G. & O. Braniff & Company, of Mexico, has been awarded the contract for all the electrical apparatus to be installed at the El Oro Mining and Railway Company, El Oro, Mexico. This contract amounts to nearly $100,000.00.

Modern Improvements.

The advance in improved methods of textile manufacturing has been so rapid that it has kept a "hustler" busy deciding as to what improvements are of practical value. One of the most important improvements that manufacturers have wanted has been a practical method to render wool non-shrinkable while retaining its other properties. Repeated tests of the nevershrink process invented by C. Scott Althouse of Reading, Pa., and its practical application in numerous mills throughout the country are reported as being very satisfactory.

The accompanying illustrations show the results obtained from the use of the "Nevershrink Process." Fig. A is an original piece of flannel,



the same size as that at Fig. B and Fig. C, except that Fig. B and Fig. C were cut only to the selvage. Fig. B was treated with the "Nevershrink" process and Fig. C was not so treated. Both were then fulled together. It will be noticed when comparing the treated piece, Fig. B, with the original Fig. A, that the former has not shrunk, while the untreated piece, Fig. C, is felted very hard.

While the "Nevershrink" process is one of the latest improvements in the textile industry, it has been on the market and in practical operation too long to be considered an experiment.

While the process requires some inexpensive machinery and becomes a distinct operation in textile manufacturing, it is so simple and inexpensive that anyone of ordinary ability can apply it. It does not require any special knowledge of textile work.

The shrinkage of wool has been objectionable in some branches of the textile industry and it is a well known fact that manufacturers have endeavored to overcome this tendency by the addition of cotton to the material. Wool, however, will shrink in proportion to the amount of it in a fabric. It is stated that the "Nevershrink" process has no effect on cotton and will stop the shrinking of whatever wool is in the material, no matter in how small proportion it is present. Everything made of wool which is subjected to washing either for domestic or manufacturing purposes is within the range of this process, which is of especial interest to the knitting branch.

Charles H. Heyer, Real Estate Trust Building, Philadelphia, Pa., has been appointed selling manager for the "Nevershrink" process and is distributing some valuable samples and giving interesting information with reference to the secret.

Ashworth Brothers.

The business long conducted in Fall River, Mass., under the name of Elijah Ashworth, manufacturer of card clothing of every description, Henry Ashworth, agent, will hereafter be carried on under the firm name of Ashworth Brothers.

A Progressive Mill Supply House.

The U. S. Mill Supply Company of Providence, R. I., whose headquarters are at 32-36 South Water St., are doing quite a business in their line. We take pleasure in referring to their advertisement in this issue, in which they claim to handle everything in mill supplies. The officers of the company are Wm. J. Rocks, president, George Kollstede, treasurer, and F. T. Rooks, secretary, all men of experience and large acquaintance among textile mills, which accounts for their popularity and constantly increasing business. It is difficult to enumerate the different specialties which they handle, and we can do no better than to refer to their advertisement, in which a number of them are mentioned. They say, "What you don't see ask for."

They have made a number of important connections with manufacturers of different lines of goods, and we feel sure that they can demonstrate to possible customers that the quality and price of their goods are entitled to favorable consideration. For a concern as young as this, their business has reached very flattering proportions, and testifies to the enterprise which they have displayed.

Textile Awards at the St. Louis Exposition.

Following is a list of the awards for textile exhibits at St. Louis:

COTTON GOODS.

Gold medals: Arlington Mills, Lawrence, Mass.; Eddystone Mfg. Co., Philadelphia, Pa.; Emden & Wormser, New York City, N. Y.; Garner & Co., New York City, N. Y.; Glenwood Works, Boston, Mass.; Manchester Mills, Manchester, N. H.; Monadnock Mills, Claremont, N. H.; Naumkeag Steam Cotton Mills, Salem, Mass.; Potomska Mills, New Bedford, Mass.; Scranton Lace Curtain Co., Scranton, Pa.; Stevens Manufacturing Co., Fall River, Mass.; J. L. Stifel & Sons, Wheeling, W. Va.; A. Wimpfheimer & Bro., Stonington, N. Y.; Whitman Mills, New Bedford, Mass.; Joseph W. Woods & Son, Boston, Mass.; Hoffman-Corr Mfg. Co., Philadelphia, Pa.

Silver medals: Arlington Mills, Boston, Mass.; I. E. Palmer, Middletown, Conn.

Bronze medals: Monomet Mills, New Bedford, Mass.; Royal Plaiter Co., New Orleans, La.

LINEN GOODS.

Gold medals: Plymouth Cordage Co., Plymouth, Mass.; Stevens Linen Works, Boston, Mass.;

WOOLEN GOODS.

Gold medals: Charlotteville Woolen Mills, Charlotteville, Va.; Chatham Mfg. Co., Elkins, N. C.; Cocheco Woolen Mfg. Co., East Rochester, N. H.; Gonic Mfg. Co., Gonic, N. H.; Hawes Von Gal Co., Danbury, Conn.; Seymour Woolen Factory Co., Seymour, Ind.; Sterling Mills, Lowell, Mass.; Talbot Mills, North Billerica, Mass.; Western Robe Co., Detroit, Mich.; Henry J. Westbrook, Midland Park, N. J.; Richard Wetherill, Putnam, New Mexico.

Grand prizes: American Woolen Co., Boston, Mass.; Arlington Mills, Boston, Mass.; Ballard Vale Mills, Ballard Vale, Mass.; L. C. Chase & Co., Boston, Mass.; John B. Stetson Co., Philadelphia, Pa.

The Canadian Westinghouse Co.

The Canadian Westinghouse Company, Limited, has sold to the Hamilton Cataract, Power, Light & Traction Company for use in its Victoria substation at Hamilton, Ontario, two motor-generator sets, each consisting of a synchronous motor and a direct current generator. The motor-generator sets will be of the two-bearing type, the generators delivering direct current at 550 volts to the railway system, and each being rated at 750 k. w. The synchronous motors will take two-phase current at 8000 alternations and 2400 volts, and will be rated at 1380 h. p. The excess of capacity in the motors is provided so that they may be used for raising the power factor of the transmission system. Power is taken through lowering transformers from the high tension transmission line from the De Cew Falls station of the company.

These motor-generator sets will be built at the works of the Westinghouse Electric & Manufacturing Company at East Pittsburg, Pa.

The Burlington Basket Company of Burlington, Iowa.

On a recent visit to the above company, we found this concern taxed to its utmost in turning out their product which consists of a full and complete line of baskets for every conceivable use. They pay particular attention, however, to baskets and trucks for textile mills. Under the able direction of Mr. E. A. Florang, the general manager, their business has grown to large proportions and their product is being shipped, not only to all parts of this country, but they are at present exporting in large quantities.

Their Burlington canvas basket is made with or without cover. It is light, strong and cheap, and well adapted for textile mills. These baskets are made of the very best quality of No. 4 duck, solidly riveted to a frame, which is built up out of the toughest hickory elm. The shoes run in one continuous piece from rim to rim, and thereby stiffen the basket in every direction. It is considerably lighter than other canvas baskets, and is guaranteed to give the very best satisfaction. It is made in all sizes.

This company also makes a complete line of rattan and ash hampers and baskets, which find general use among textile mills. One of their specialties is their line of mill trucks, which they have been sending to all parts of the country, and which can be extra strapped and fitted out with ball bearing castors if desired. These can be made any size desired, and are built with light posts on the inside which are riveted to the braces on the outside, making them in every way strong and substantial.

The Burlington factory now covers 72,000 square feet of floor space, which will give some idea of the volume of business done by this concern. It occupies three acres of ground and has the capacity of 10,000 baskets per day. The shipping facilities are unsurpassed, and with many years of experience in the manufacturing of baskets, together with the fine equipment of machinery and appliances, they are in a position to produce a fine line which they are able to ship with promptness and despatch.

We take pleasure in recommending them to the trade, and would recommend that any one interested in their product would write them for catalogue "B" and prices, which they will be much pleased to send promptly.

The Cleveland Woolen Mills.

The business of the Cleveland Woolen Mills of Cleveland, O., is steadily on the increase and their plant now covers a large area. The mills are owned by The Collins, Taylor Co., and their product consists of a line of all wool shoddies. They make a specialty of fine light and colored stocks. They have lately completed quite an addition to their mill by adding a brick building three stories high, 100 by 55 feet, which they are at present using for storage purposes, but which they can equip with additional machinery just as soon as the conditions warrant.

Chimney vs. Mechanical Draft.

A chimney with natural draught will have a draught dependent upon its height, the power of which will not vary, except upon the rise or fall of the internal temperature. It has therefore, no sucking power; in fact, the term suction in this connection is a fallacy. The chimney acts because the external air is heavier than the internal, and thus presses into the chimney by the only available opening, viz: that at the bottom, the furnace front. The pressure or intensity of the draught fixes the amount of fuel it is possible to burn on a given area of grate. It therefore become necessary, when it is desired to increase the steaming capacity of a boiler by increasing its coal consumption, to increase the intensity of the draught, and the only way in chimney draught is to increase the temperature of the gases passing up it, or increase the height of the chimney. The first method, of course, means a large amount of waste, and is a very uneconomical arrangement; the second is expensive and unusual. A chimney stack 150 feet high will burn from 15 lbs. to 20 lbs. of coal per square foot of grate area per hour under normal conditions, but in wet or foggy weather it will be very much less than this, as the wet air is lighter than the dry, and thus produces less pressure at the furnace (the weight of water vapor is about half that of air). A fair average of temperature in the furnace is 2,400 degs. F., and that of the escaping gases at the chimney, without economizers, 600 degs. F. This means that one-quarter of the total heat generated is sent up the chimney to waste. Thus, on a 2,000 h. p. plant, almost 500 h. p. is going up the chimney per hour, and the coal bill necessary to sustain this will come to a big figure in the year.

It is not the author's contention, but it has become a well ascertained fact, that it is cheaper and better in every way to provide the necessary supply of air for burning fuel in steam boilers by mechanical means, and to take as much heat out of the hot gases after they have ceased to be in contact with the boiler itself before they are turned out into the atmosphere, than to do it in the older way by utilizing a portion of the heat generated to create the necessary supply of air. This is the primary reason for using a mechanical means of moving the air. The heat previously necessary to create the draught by means of a chimney may now be employed usefully in other directions.—The Engineering Review, London.

Mixing Kettles.

John E. Smith's Sons Co., 50 Broadway, Buffalo, N. Y., are builders of improved steam jacket kettles, either with or without mixing apparatus, which they state cost about one-half the price of copper kettles. They are used extensively by leather manufacturers and have recently been introduced into textile mills for the mixing of size, soap, dyestuffs, etc. They invite manufacturers to correspond with them in regard to their line and are confident they can meet the quality and price of any of their competitors.

Starch.

The great trouble with the old-time potato starch is that it does not easily dissolve, nor is it as transparent as desirable. The international prize starch, brought out recently by the Arabol Mfg. Co., 100 William St., New York, is said to mark a great improvement in these respects, requiring very little if any softening, cooking thinner and being very smooth and slippery on the yarn. The manufacturers claim that a smaller quantity will do more work than common potato starch.

A Non-Freezing Fire Extinguisher Solution.

A serious defect in fire extinguishing solutions has been their liability to freeze, thus becoming useless when required in an emergency. The Franklin H. Kalbfleisch Co., 31 Burling Slip, New York City, has solved this difficulty by the manufacture of a fire extinguishing compound which, it is claimed, does not freeze even at a very low temperature.

This solution is an efficient fire extinguisher and its non-freezing properties make its use possible in exposed locations, such as unheated sheds, in out-buildings where other solutions would freeze, and where in case they did not destroy the holder, would prove of little use in case of fire.

Owners of gasoline automobiles may be interested in the new "Antifreeze" solution offered by this company for use in the cooling system of automobiles, in place of water. This solution will not freeze, even in extremely cold weather and is efficient as a cooling medium for the engine. "Antifreeze" does not effect the metal parts of the machine or the rubber connections, and is entirely odorless, no matter to what degree it is heated. The advantage over oil and glycerine is obvious.

The company also offers the Red Cross Purifier, a disinfectant and deodorant. This purifier absorbs and destroys poisonous gases, neutralizes obnoxious odors and purifies the air, preventing danger of spreading disease through contamination.

Further information can be obtained upon application to the manufacturers.

Boiler Feed Pumps.

The Goulds Tripler Boiler Feed Pump, operated by a 40 horse power electric motor, located in the boiler house of Machinery Hall at the World's Fair, St. Louis, has been purchased by the Lewis and Clarke Exposition Co., to be used for the same purpose at their Exposition to be held at Portland, Oregon next year.

The Goulds Mfg. Co. of Seneca Falls, N. Y., was awarded a gold medal for this pump which supplied feed water for boilers of 4,000 h. p. in the boiler house that furnished the power for Machinery Hall.

The Goulds Mfg. Co. was also awarded three other gold medals: one for their exhibit in Machinery Hall of power pumps and one each for their exhibit of hand pumps, sprayers and spray fittings in Horticultural Hall.

W lliam Allen Sons Company.

We take pleasure in drawing attention to the reorganization of a long established concern of Worcester, Mass., which is now known as the Wm. Allen Sons Co. The advertisement of this new company appears in this issue of this paper. The present concern with new capital and under new management starts out with every prospect of success and they are today much gratified, not only with the number of orders on their books, but with the favorable prospects for the future.

The improved bleaching and boiling kiers manufactured by this company embody every improvement suggested by long experience in that trade. They are built in all sizes and are in use in a number of representative mills throughout the country. Steam boxes for yarns, print goods, etc., bearing the name of Wm. Allen are as favorably known as the kiers. They also build upright and horizontal tubular boilers, smoke stacks, tanks and heavy sheet iron work, and we take much pleasure in recommending them to the trade. The business will be under the personal supervision of William G. Allen, general manager.

Large Electrical Generators Driven by Gas Engines.

The Califofnia Gas & Electric Corporation, San Francisco, California, has just placed an order with Crocker-Wheeler Company, Ampere, N. J., for three 4,000 k. w. capacity, 3 phase, 13,200 volt, 25 cycle, 83 r. p. m., revolving field alternators, to be driven by 6,000 h. p. gas engines built by Snow Engine Co. These generators are believed to be the largest in capacity in the world driven by gas engines, and will furnish power for operating all the street railways in San Francisco and vicinity.

This important sale by a company which has been building alternating current machinery only a few months is a cause for congratulation. It is due in part to the fact, as announced several months ago, that the Crocker-Wheeler Company is the American licensee of Brown, Boveri & Cie., the celebrated Swiss electrical engineers. The reputation for excellence which the Crocker-Wheeler Company has built up during the past sixteen years of manufacture of direct current apparatus, has had much to do with the result.

Western Agent for Fire Hose.

We are advised by the Eureka Fire Hose Co., 13 Barclay St., New York, that Mr. Maurice E. Baird will represent them exclusively in the sale of their standard brands of fire hose to fire departments in Iowa, Northern Wisconsin, Minnesota, North and South Dakota, and Montana.

For some years Mr. Baird, together with his brother, Clay Baird, has represented the Eureka Fire Hose Company at Chicago with marked success, and we bespeak for him in his larger field of operations equally gratifying results. Mr. Baird will make his new headquarters at Minneapolis, Minn.

Midwinter Sports in Montreal and Quebec.

Midwinter sport in the Canadian cities of Montreal and Quebec spells "beautiful amusement." Snow-shoeing, tobogganing, skating, coasting, skiing and sleighing are the winter pastimes. Adorned in their becoming raiment of snow; cold, sharp, healthful atmosphere, minus the uncomfortable qualities of our New England frigidity, the Canadian cities present an inviting aspect. Each city has hundreds of interesting view points and visiting places such as historical spots, ancient landmarks and old buildings besides a score of amusement places.

Don't fail to take advantage of the treat arranged by the Boston & Maine Railroad for December 29, 30, 31. Round trip tickets are on sale at almost half rates. For full information apply General Passenger Department, Boston & Maine Railroad, Boston, or nearest ticket agent.

Prominent Mill Engineers and Architects.

We are pleased to record the rapid and continuous growth of the business of Dean & Main, mill engineers and architects, whose headquarters are in the Exchange Building, 53 State St., Boston, Mass. On account of their growing business as advisers and experts in their particular line, they have been compelled to increase their quarters by the addition of three extra rooms, which gives them just about double their former floor space. They not only prepare the plans and specifications, but personally superintend the construction or reorganization of steam and water power plants. They are particularly well known in the textile trade, and have built a number of large textile establishments which reflect great credit upon them. They may also be engaged to prepare valuations and reports on plants for sale or anything in that particular line in keeping with their profession.

Any company contemplating building a new plant or remodeling in any way, would serve their interests well by communicating with them.

Business Rushing.

The plant of the G. Woolford Wood Tank Mfg. Co., Philadelphia, with office in Land Title Bldg., Broad and Chestnut Sts., is running to its utmost capacity both night and day. They have been especially fortunate in laying in a large stock of lumber, and at the present time are carrying over two million feet, mostly cedar and cypress, which is especially adapted for dye house and mill work. This large plant makes everything in the way of tanks, towers and vats for all purposes.

Under Construction.

The Vacuum Process Co., 15 State St., Boston, have among machines under construction a two-string cell dryer for the Waterhead Mills, a cell dryer with 42-inch cells for the Queen Dyeing Co., a cell dryer 72 inches wide for the Cocheco Mfg. Co., and one 50-inch machine for S. Slater & Sons.

Tested Brakes for Two Years.

Few people can realize the responsibility of making the decision in regard to air brakes for a road as large as the Cleveland Electric. The amount of money involved in such a transaction is enormous.

For a number of years the steam railroads have used an air brake as their standard. The electric lines have experimented with various kinds of brakes to ascertain if they could not improve upon this type of brake for their work. The suburban electric roads have followed in the footsteps of the older organizations by adopting the air brake as their standard, the main difference being that the steam railroads use steam to compress the air for the brakes, while electric roads rely upon an electric motor.

When air brakes were originally tried by the electric roads, the manufacture of these brakes relied upon a pump, which was fastened to the axle of a car to compress the air. This type of brake a number of years ago was tried on the A., B. & C. line, but was not entirely satisfactory. The electric motor was then turned to in connection with a compressor to supply the air. The manufacturers have for a number of years been endeavoring to improve the motor and compressor, and have so far succeeded that if a road is willing to go to the expense of using this type of brake, very little risk is assumed by the electric roads.

A number of the larger cities, such as Philadelphia, Buffalo and Detroit have all their cars equipped with air brakes, same being installed as new and larger cars were purchased, but it remained for the Cleveland Electric to place the largest contract for the individual air brake compressors that has ever been placed in this country. The decision was not arrived at until after over two years of experimenting with practically every known type of brake that is manufactured, and after an unparalleled test in the history of electric railroading.

All the air brake manufacturers of this country were in competition for this order, as they fully realized the value of such a contract, both in regard to the money involved, and the effect it would have on other roads in this country.

The National Electric Co., of Milwaukee, Wis., was awarded the contract last week, and is arranging to ship several car loads of air brakes which will be installed under the new convertible type of cars of the Cleveland Electric railway immediately. —Cleveland Plain Dealer.

Business Helpers.

The Audit & Appraisement Co. of America, whose main office is in the Land Title Building, Philadelphia, and New York office at 55 Liberty St., New York, fills a niche in the business world which is becoming recognized as a most important one, although there are still manufacturers who do not appreciate the importance of the service that they are prepared to render.

It is difficult for a company of this kind to express by its name the entire scope of its business, although the Audit & Appraisement Co. gives a fairly good suggestion of its business in its name, but besides the mere auditing of books and appraisement of properties, they undertake special work, such, for instance, as investigating and planning cost systems for manufacturing plants in different lines, the investigation of books and accounts for creditors, preparation of financial statements, expert examination and appraisement of all kinds of properties, plants and enterprises for manufacturing or other purposes, engineering investigations, the facts and possibilities of projected enterprises, reorganization plans formulated, an expert knowledge in every field of technical industry furnished to counsel in court cases. Under their by-laws all business entrusted to this company is absolutely confidential. The company is equipped to do any of this work anywhere at once. The Board of Directors comprises men of high standing in business and financial circles and assures confidence.

The Stephenson Bar Belt Dressing.

Here is a letter received recently by the Stephenson Mfg. Co., Albany, N. Y., from a mill superintendent in Connecticut:

"Enclosed please find $1.00 for which please send me a dollar's worth of your valuable belt dressing. I used your sample and was greatly pleased with it and tried my best to approach the company to buy some, but the last word was: 'We are not going to bother with it.' So I send the dollar out of my own pocket because I like the dressing so well. It's neat and I get quick results from it. I would send for more but don't feel as though I ought to buy it for the millionaires.

"If you have a man on the road I think he could do some business here as the proprietors do all the buying, but don't mention my name or they would smell the rat. They don't remember the dressing's name, so I think that he would make some kind of a hitch and they naturally will consult me.

"I have been all over New England, overseer and here superintendent for the past four years, and this is the best belt dressing I ever used."

Houghton Thread Boards.

From time to time we have called attention to the good results following the use of the metallic thread boards manufactured by L. T. Houghton of Worcester, Mass. These boards have been installed in scores of prominent mills all over the country, the most important installation being at the Fall River Iron Works, where 300,000 wood boards were changed over to the Houghton steel boards, at an expense of $30,000, and it may be taken for granted that this mill would not have made the change if they had not considered it well worth the cost.

We have recently received from Mr. Houghton a statement of the remarkable showing made by his steel thread boards in the last mill where they were installed, taking the place of old style boards.

This mill has 30,640 spindles running on warp, and the production before the change in thread boards was 128 beams per week. Since the change the production has been 134 beams per week, and the mill now has a lot of beams ahead, a condition which never before existed in this mill. They

are now running on a lower grade of cotton than formerly, and the help tend nine sides where formerly they could not keep eight sides running as they should do. The change is a gain of six beams per week or about 2,000 pounds of yarn, an increase of 4.7 per cent. of former net production. Assuming $16 as the value of yarn produced per spindle per annum, Mr. Houghton figures there is a saving of 75.2 cents per spindle per year, or over 700 per cent. of the cost of changing the thread boards, or an increased production of yarn valued at $23,041.28.

These figures show the remarkable result of an increased yarn product of nearly 5 per cent., with a decreased labor cost in spinning room of 12 1/2 per cent.

He will be pleased to make an appointment with anyone desiring to investigate the subject and show them the spindles in this mill in operation.

The Seaboard Despatch Line operating from New England territory, all rail by Pennsylvania Railroad and over the Seaboard Air Line and connections to the South, will be conducted as an independent agency, with headquarters at 360 Washington St., Boston, Mass. Requests for rate information, bills of lading, etc., regarding traffic of interest to this line should be addressed to W. C. Sherman, New England Agent.

Spindle Patent Case.

So much interest has been manifested in the spindle patent case that we have procured a copy of the opinion of the Court handed down Nov. 1, 1904. As conflicting reports of the meaning of this opinion have been published, in fairness to both parties we print it in full that our readers may form their own opinions:

CIRCUIT COURT OF THE UNITED STATES,

DISTRICT OF RHODE ISLAND.

Sawyer Spindle Company of Maine vs. S. Fred Carpenter. In Equity, No. 2,638.

Opinion of the Court.

November 1, 1904.

BROWN, J. Letters Patent No. 363,425 for a spindle support for spinning machines, issued May 24, 1887, on the application of Albert R. Sherman filed July 3, 1882. The defendant contends that this patent expired in 1897, through a limitation of its term by a British patent to Alexander Melville Clark, dated May 19, 1883, No. 2,510, for an invention "communicated to him from abroad by Albert Read Sherman." To meet this ground of defence, the complainant contends that the act of Congress of March 3, 1903, Chap. 1019, Vol. 32, U. S. Stat., pp. 1225, 1226, prevents the expiration of the patent in suit even if it is for the same invention patented by the British patent to Clark.

It is argued that this is a remedial statute, and that from its date, no matter what evidence may be brought before the Court as to the patentee's having procured a foreign patent, the Court shall not declare any patent invalid on account of a foreign patent unless the application for the United States patent was more than twelve months later than the application for the foreign patent; that the Sherman patent in suit was applied for before the British patent, and therefore connot be limited thereby. To declare a patent invalid, and to declare that a patent was only for a term of less than seventeen years, are, however, two different things.

Section 4887, Rev. Stat., before the amendments of 1897 and 1903, read as follows:

"No person shall be debarred from receiving a patent for his invention or discovery, nor shall any patent be declared invalid, by reason of its having been first patented or caused to be patented in a foreign country, unless the same has been introduced into public use in the United States for more than two years prior to the application. But every patent granted for an invention which has been previously patented in a foreign country shall be so limited as to expire at the same time with the foreign patent, or, if there be more than one, at the same time with the one having the shortest term, and in no case shall it be in force more than seventeen years."

Clearly the phrase "nor shall any patent be declared invalid" did not, in this statute, include a declaration or judgment of a limitation of the term of a patent. In the Telephone cases, 126 U. S. 572, it was said:

"In our opinion is has been settled by the decision of this court in O'Reilly v. Morse, 15 How. 62, 112, and inpliedly by that in Siemens v. Sellers, 123 U. S. 276 . . . that the effect of sec. 4887 of the Revised Statutes is not to render invalid an American patent which does not bear the same date as a foreign patent for the same invention, but only to limit its term."

In Bates Refrigerating Co. v. Sulzberger, 157 U. S. 1, 43, it was said: "If he obtains foreign patents for his invention before obtaining one here, the American patent is limited by law, whether it is so expressed or not in the patent itself, to expire with the foreign patent having the shortest term."

The defendant makes no contention that the patent in suit was invalid, but contends that, by reason of the existence of the British patent, the term of the American patent was limited under the law.

The phrase "nor shall any patent be declared invalid" was not enlarged in meaning by the act of March 3, 1897, Chap. 391, sec. 3, 29 Stat. 602. Section 8 of the amendatory act provided also that the section, as amended, should not apply to a patent granted prior to January 1, 1898, etc. Therefore, it appears that, under the law as it existed at the date of the application for the patent in suit and at the date of the expiration of the British patent, the patent in suit was for a term less than seventeen years.

Assuming that the British patent was for the same invention, and was procured by authority of Sherman, it had run its term and expired in 1897. Do we find in the amendatory legislation any intention to revive patents that had previously expired by limitation? Certainly not in the amendment of 1897, but, on the contrary, an express intention to the contrary.

It is argued in effect, that we may find in the act of 1003 an intention of Congress to revive a patent which had been legally dead for about six years.

Tested Brakes for Two Years.

Few people can realize the responsibility of making the decision in regard to air brakes for a road as large as the Cleveland Electric. The amount of money involved in such a transaction is enormous.

For a number of years the steam railroads have used an air brake as their standard. The electric lines have experimented with various kinds of brakes to ascertain if they could not improve upon this type of brake for their work. The suburban electric roads have followed in the footsteps of the older organizations by adopting the air brake as their standard, the main difference being that the steam railroads use steam to compress the air for the brakes, while electric roads rely upon an electric motor.

When air brakes were originally tried by the electric roads, the manufacture of these brakes relied upon a pump, which was fastened to the axle of a car to compress the air. This type of brake a number of years ago was tried on the A., B. & C. line, but was not entirely satisfactory. The electric motor was then turned to in connection with a compressor to supply the air. The manufacturers have for a number of years been endeavoring to improve the motor and compressor, and have so far succeeded that if a road is willing to go to the expense of using this type of brake, very little risk is assumed by the electric roads.

A number of the larger cities, such as Philadelphia, Buffalo and Detroit have all their cars equipped with air brakes, same being installed as new and larger cars were purchased, but it remained for the Cleveland Electric to place the largest contract for the individual air brake compressors that has ever been placed in this country. The decision was not arrived at until after over two years of experimenting with practically every known type of brake that is manufactured, and after an unparalleled test in the history of electric railroading.

All the air brake manufacturers of this country were in competition for this order, as they fully realized the value of such a contract, both in regard to the money involved, and the effect it would have on other roads in this country.

The National Electric Co., of Milwaukee, Wis., was awarded the contract last week, and is arranging to ship several car loads of air brakes which will be installed under the new convertible type of cars of the Cleveland Electric railway immediately. —Cleveland Plain Dealer.

Business Helpers.

The Audit & Appraisement Co. of America, whose main office is in the Land Title Building, Philadelphia, and New York office at 55 Liberty St., New York, fills a niche in the business world which is becoming recognized as a most important one, although there are still manufacturers who do not appreciate the importance of the service that they are prepared to render.

It is difficult for a company of this kind to express by its name the entire scope of its business, although the Audit & Appraisement Co. gives a fairly good suggestion of its business in its name, but besides the mere auditing of books and appraisement of properties, they undertake special work, such, for instance, as investigating and planning cost systems for manufacturing plants in different lines, the investigation of books and accounts for creditors, preparation of financial statements, expert examination and appraisement of all kinds of properties, plants and enterprises for manufacturing or other purposes, engineering investigations, the facts and possibilities of projected enterprises, reorganization plans formulated, an expert knowledge in every field of technical industry furnished to counsel in court cases. Under their by-laws all business entrusted to this company is absolutely confidential. The company is equipped to do any of this work anywhere at once. The Board of Directors comprises men of high standing in business and financial circles and assures confidence.

The Stephenson Bar Belt Dressing.

Here is a letter received recently by the Stephenson Mfg. Co., Albany, N. Y., from a mill superintendent in Connecticut:

"Enclosed please find $1.00 for which please send me a dollar's worth of your valuable belt dressing. I used your sample and was greatly pleased with it and tried my best to approach the company to buy some, but the last word was: 'We are not going to bother with it.' So I send the dollar out of my own pocket because I like the dressing so well. It's neat and I get quick results from it. I would send for more but don't feel as though I ought to buy it for the millionaires.

"If you have a man on the road I think he could do some business here as the proprietors do all the buying, but don't mention my name or they would smell the rat. They don't remember the dressing's name, so I think that he would make some kind of a hitch and they naturally will consult me.

"I have been all over New England, overseer and here superintendent for the past four years, and this is the best belt dressing I ever used."

Houghton Thread Boards.

From time to time we have called attention to the good results following the use of the metallic thread boards manufactured by L. T. Houghton of Worcester, Mass. These boards have been installed in scores of prominent mills all over the country, the most important installation being at the Fall River Iron Works, where 300,000 wood boards were changed over to the Houghton steel boards, at an expense of $30,000, and it may be taken for granted that this mill would not have made the change if they had not considered it well worth the cost.

We have recently received from Mr. Houghton a statement of the remarkable showing made by his steel thread boards in the last mill where they were installed, taking the place of old style boards.

This mill has 30,640 spindles running on warp, and the production before the change in thread boards was 128 beams per week. Since the change the production has been 134 beams per week, and the mill now has a lot of beams ahead, a condition which never before existed in this mill. They

are now running on a lower grade of cotton than formerly, and the help tend nine sides where formerly they could not keep eight sides running as they should do. The change is a gain of six beams per week or about 2,000 pounds of yarn, an increase of 4.7 per cent. of former net production. Assuming $16 as the value of yarn produced per spindle per annum, Mr. Houghton figures there is a saving of 75.2 cents per spindle per year, or over 700 per cent. of the cost of changing the thread boards, or an increased production of yarn valued at $23,041.28.

These figures show the remarkable result of an increased yarn product of nearly 5 per cent., with a decreased labor cost in spinning room of 12 1/2 per cent.

He will be pleased to make an appointment with anyone desiring to investigate the subject and show them the spindles in this mill in operation.

The Seaboard Despatch Line operating from New England territory, all rail by Pennsylvania Railroad and over the Seaboard Air Line and connections to the South, will be conducted as an independent agency, with headquarters at 360 Washington St., Boston, Mass. Requests for rate information, bills of lading, etc., regarding traffic of interest to this line should be addressed to W. C. Sherman, New England Agent.

Spindle Patent Case.

So much interest has been manifested in the spindle patent case that we have procured a copy of the opinion of the Court handed down Nov. 1, 1904. As conflicting reports of the meaning of this opinion have been published, in fairness to both parties we print it in full that our readers may form their own opinions:

CIRCUIT COURT OF THE UNITED STATES,

DISTRICT OF RHODE ISLAND.

Sawyer Spindle Company of Maine vs. S. Fred Carpenter. In Equity, No. 2,638.

Opinion of the Court.

November 1, 1904.

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It is argued that this is a remedial statute, and that from its date, no matter what evidence may be brought before the Court as to the patentee's having procured a foreign patent, the Court shall not declare any patent invalid on account of a foreign patent unless the application for the United States patent was more than twelve months later than the application for the foreign patent; that the Sherman patent in suit was applied for before the British patent, and therefore connot be limited thereby. To declare a patent invalid, and to declare that a patent was only for a term of less than seventeen years, are, however, two different things.

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Assuming that the British patent was for the same invention, and was procured by authority of Sherman, it had run its term and expired in 1897. Do we find in the amendatory legislation any intention to revive patents that had previously expired by limitation? Certainly not in the amendment of 1897, but, on the contrary, an express intention to the contrary.

It is argued in effect, that we may find in the act of 1003 an intention of Congress to revive a patent which had been legally dead for about six years.

The question of the constitutional power of Congress to enact retroactive statutes concerning patents has been argued, but is immaterial. Statutes are construed to operate prospectively only, unless the contrary intention is manifest beyond a reasonable doubt. Shreveport v. Cole, 129 U. S. 36, 43. The amendments of March 3, 1903, so far as I can see, contain no indication of an intention to revive expired patents, or to give the phrase "nor shall any patent be declared invalid" a meaning broader than before. The act of 1903, in my opinion, does not forbid the limitation of the patent in suit by the term of the British patent to Clark.

The plaintiff contends also that the invention of claim 5 of the patent in suit was not patented by the British patent.

It is conceded that the first four claims of the patent in suit and of the British patent are substantially identical, and that the inventions covered thereby are the same. The plaintiff argues that, though the patent in suit may have expired as to four of its claims, it may still exist as a valid patent for the invention of the fifth claim, citing Aquarama Co. v. Old Mill Co., 124 F. R. 229. I do not find, however, in the opinion in that case, any reference to Siemens v. Sellers, 123 U. S. 276, where a similar contention was made—p. 280. The Court said, p. 283:

"A patent cannot be exempted from the operation of the law by adding some new improvements to the invention, and cannot be construed as running partly from one date and partly from another. This would be productive of endless confusion."

But assuming, for argument only, that a patent may be limited in term by a foreign patent as to some of its claims and not as to others; that it may expire in part and survive in part, it would still seem impossible that a single claim should in part expire and in part survive. Where the difference between two claims is merely in breadth, the first being a specific claim for a particular embodiment of an invention, and the second being a generic claim which covers the specific form of the first claim and other forms as well, it follows, upon the expiration of the species claim, that the specific invention claimed therein can no longer be held to infringe the patent, and that the generic claim has expired in part at least.

Two patents and two claims may be regarded as for the same invention, though one claims only a special machine, and the other claims broadly a genus which includes the former. Otis Elevator Co. v. The Portland Co., 127 F. R. 557; Miller v. Eagle Mfg. Co., 151 U. S. 186; Robinson on Patents, secs. 464, 465, Vol. 2, p. 45. When this is the case, though the American claim may be broader than that of the prior British patent, it is still true that what is claimed under the generic claim has already been patented in a foreign country. I can see no reason why the rules which are applied to determine the question of double patenting when United States patents are involved are not also applicable when the question is whether the invention has been first patented in a foreign country.

What is the distinction between claim 5 of the patent in suit and claim 3 of the British patent? It is not denied that the invention of claim 3 of the British patent would infringe claim 5 of the American patent in suit. Complainant's brief says:

"A structure which would infringe Sherman's fifth claim in suit would not infringe the British patent. In other words, the invention patented in the fifth claim is not patented at all by the English patent."

This statement cannot be accepted. A structure which would infringe Sherman's fifth claim might or might not infringe claim 3 of the British patent, or claim 3 of the patent in suit. The distinction between the claims is merely one of breadth. The complainant's brief says:

"The fifth claim does not require, as do the other four claims, that the bolster should be 'fitted loosely within the bolster-case throughout its length.'"

This is pointed out as the vital distinction. It is said that the peripherally loose bearing was left out of the fifth claim "because his invention of the lock between bolster and bolster-tube could equally be embodied with any detached bolster whose foot could move with the spindle." In other words, it is essential only that the foot of the bolster move with the spindle. This, however, is essential to both claim 3 and claim 5. A bolster fitted loosely throughout its length has a looseness at the foot and also a looseness at the band-pull. Irrespective of the latter feature, the invention of claim 3 embodies a bolster moving at its foot and restrained from rotation by a pin connecting it with the bolster-case. The limiting words do not take out of claim 3 any of the essential elements of claim 5.

The case stands thus: Claim 5 covers claim 3, and more. The relation is that of inclusion. The particulars in which the structures of claim 3 and claim 5 are identical are looseness at the foot, with a connection to prevent rotation with the spindle. The difference is that in claim 3 is required also a looseness throughout the length, which is nonessential to the Sherman invention as claimed in claim 5 if we construe that claim as broadly as the complainant desires. The structure of claim 3 is free, the patent having expired as to this.

The defendant's structure has looseness of the bolster throughout the whole length. It would infringe both claim 5 and claim 3. It is distinguishable from the invention of claim 5 exactly as the structure of claim 3 is distinguishable. How can a structure which has the limitation of claim 3, the sole feature upon which claim 5 is distinguishable, be still covered by the generic claim? It is clear that a large part of the contents of the verbal expression, claim 5, has been patented in England under claim 3, and is free.

The only contention left for the complainant is that such part of the contents of this generic claim as has not been protected by the specific claim should still be protected by the patent. Disregarding the inconvenience of allowing a patent to expire in sections, part at one date and part at another, and the greater inconvenience of allowing a single claim to expire in part and to survive in part as a limited claim, and adopting this view, we should then arrive at the conclusion that the defendant's device was within only that part of the generic claim that had expired, and not within the part that had survived.

Claim 5 and claim 3 are not, in my opinion, claims for separable subject-matter, and the invention of claim 5 has been previously patented by the British patent.

The remaining point in defense is that there is not sufficient proof that the British patent to

Clark was taken out by the authority or with the consent of Sherman or his assignee. Construing sec. 4,887 in Hobbs v. Beach, 180 U. S. 383, 397, and referring to the following clause: "every patent granted for an invention which has been previously patented in a foreign country shall be so limited as to expire at the same time with the foreign patent," it was said: "but this obviously presupposes that the foreign patent shall have been obtained by the American patentee or with his consent."

Proof merely of prior patenting in a foreign country by a stranger is not sufficient to limit a United States patent. Where the foreign patent does not issue to the patentee of the American patent, evidence must be produced to show that the foreign patentee acted with the authority or consent of the American patentee; otherwise, he who sets up the foreign patent has not established an essential element of the statute as construed by the Supreme Court. That a stranger has taken out a foreign patent for the same invention, affords no evidence of the consent or authority of the American patentee.

The defendant has the burden of proving as an essential fact that the foreign patent was obtained by the American patentee or with his consent. Is this fact sufficiently proved in this case? The answer avers that Sherman obtained letters-patent of Great Britain, granted and published in 1883, for the term of fourteen years. There is offered in proof a British patent, A. D. 1883, 19th May, No. 2,510, which proves that the invention of the patent in suit was previously patented in a foreign country. It is entitled:

"Letters-Patent to Alexander Melville Clark of the firm of A. M. & W. Clark of 53 Chancery Lane in the County of Middlesex, Fellow of the Institute of Patent Agents for an invention of improvements in and connected with spinning spindles and their bearings, communicated to him from abroad by Albert Read Sherman," etc.

The provisional specification and specification contain the words, "communicated to me from abroad by Albert Read Sherman," etc.

It is argued that authority is proved by the fact of communication, and by the possession by Clark of a substantially correct copy of Sherman's specification as it then stood on the files of the United States Patent Office. For what other purpose could it have been communicated by Sherman than for the procurement of a patent? is the inquiry of defendant's counsel.

Assuming that there is full proof of a voluntary communication of this invention by Sherman to Clark, does it follow that the communication was for the purpose of procuring a patent, or that Sherman authorized Clark to procure a patent? Might not a mere intermeddler, who had been informed of the invention by the American patentee, in procuring a patent for his own purposes and without authority, use the words "communicated to me from abroad by," etc. To say that A. has communicated to me an invention does not seem to me substantially equivalent to saying that he authorized me to procure a patent.

The burden is on the defendant to show authority. He shows something short of this, to wit, a communication of an invention. This it is true, would be a natural step preceding an authorization of an agent to procure a patent, but it might well have been made without such purpose. Proof of a communication does not shut out a reasonable probability that there did not accompany the communication any authority to procure a patent. The copy of the British patent affords no direct evidence of authority. The argument, in substance, is that it proves a communication, which raises a presumption of authority to procure a patent. I seriously doubt, however, whether we may safely say that a presumption of this character arises, or that proof of the communication of an invention amounts to prima facie proof of authority to take out a foreign patent. Upon mere proof that a patentee has described or communicated his invention, is it proper to cast upon him the burden of proving that he did not authorize the taking out of a foreign patent?

As the defendant has filed a motion for leave to take further testimony on this point, it is sufficient to say that it is by no means clear that such evidence is not necessary, that the defendant should forthwith close his testimony, and that at present a supplemental brief from the complainant on this point seems necessary.

The motion for leave to take further testimony is granted.

Recent Textile Patents.

COMBING MACHINE, Silk. 773,811. Edward H. Rollins, Manchester, Conn.

COMBING MACHINE Attachment. 774,399. August A. Sack, Providence, R. I.

COMBS. Traverse Mechanism for Warpers. 774,696. Alonzo E. Rhoades, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

COTTON PICKING or Harvesting Machine. 773,357. John W. Webb, Greenville, Miss.

COTTON WEEVIL Destroyer. 773,433. Lee A. Stephens, Watt, Texas.

DRYING APPARATUS. 773,390. Heinrich Hencke, Berlin, Germany.

DYEING, ETC., Apparatus for. 774,407. Otto Venter, Chemnitz, Germany.

BRAIDING MACHINE. 772,479. Adolph Siegrist, New York city.

COTTON PICKER. 770,934. Charles B. Shreeves, Denison, Tex.

DYEING COPS, ETC. Apparatus for 772,581. Romulus Rawson and Edward Lodge, Huddersfield, Eng.

FIBER DECORTICATING MACHINE. 772,823. Gerrit M. E. Pos, Amsterdam, Netherlands.

FIBRES, Apparatus for Retting Vegetable. 774,856. Bertrand S. Summers, Chicago, Ill.

FLIER. 773,268. Harry Spence, Sanford, Me.

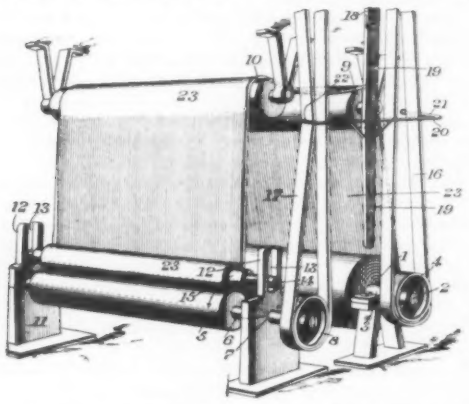
LOOM. 773,687. Charles F. Perham, Lowell, Mass., assignor to Perham-Stickney Co., Lawrence, Mass.

BALING FIBROUS MATERIAL. 776,956. William L. Spoon, Coble, N. C.

BOBBIN. 777,000. Francis Clark, Philadelphia, Pa.

BURLING or Perching Roll. 776,260. Arthur L. Robertshaw, Philadelphia, Pa.

This invention relates to an improvement in burling or perching rolls. It provides means for



mechanically reeling the web in either direction, so that the percher is able to give his full attention to the inspection of the cloth and is not required to manipulate the same by hand.

COTTON PICKER. 776,467. William W. Hoskins, Velasco, Texas.

COTTON PICKING Apparatus. 777,897. Barnwell R. Heyward, Albany, N. Y.

COTTON PICKING Machine. 775,456. James F. O'Shaughnessy, New York, N. Y., assignor to The Cotton Picker Co.

COTTON PICKING Machine. 775,451. George A. Lowry, Boston, Mass., assignor to The Cotton Picker Co.

DYEING APPARATUS. 776,069. Joe Kershaw, Bradford, England.

DYEING. Apparatus for. 775,621. Arnold Fankhauser and Adolf Ryser, Baden, Switzerland, and Friedrich J. B. Knibiehler, Lorrach, Germany.

DYEING MACHINE. 776,237. John R. Greenwood, Boothwyn, Pa.

DYEING MACHINE. 776,327. Joseph Hussong, Camden, N. J.

FIBRE CLEANING Machine. 777,017. Joseph Garcia, Brooklyn, N. Y.

FABRIC TREATING Apparatus. Tubular. 776,150. William R. Smith, Buffalo, N. Y.

FABRIC TURNING Machine. 775,992. Charles S. Shallenberger, St. Louis, Mo., assignor to Bemis Bros. Bag. Co., St. Louis, Mo.

KNOTTER. 776,271. Frederick Thomasson, Manchester, England.

LOOM BOX Motion Mechanism. 774,488. Frank A. Meyers, Paterson, N. J., assignor of one-half to Stern & Pohly, Paterson, N. J.

LOOM for Cross Weaving. 773,704. Robert Bates, Philadelphia, Pa.

MEASURING Cloth, Etc., Machine for. 773,861. John F. Ferris, Smith Center, Kansas.

MEASURING and Delivering Device, Rope. 774,987. Samuel D. Lindsay, Chicago, Ill.

MEASURING Machine, Cloth. 774,634. David A. Albright, Afton, W. Va.

PRINTING Machine, Tapestry. 773,461. Walter P. Benham and John K. Williamson, Philadelphia, Pa.

SPINDLE LUBRICATING Means. 777,394. James Bodden, Oldham, England, assignor to William Bodden & Son, Ltd., Oldham, England.

SPINDLES. Bobbin Clutch for Rotatable. 776,141. Clarence E. Metcalf, Hopedale, Mass., assignor to Sawyer Spindle Co.

SPINDLES. Bobbin Clutching Means for Spinning. 776,142. Clarence E. Metcalf, Hopedale, Mass., assignor to Sawyer Spindle Co.

SPINDLES. Bobbin Clutching Means for Rotatable. 776,163. William E. Allen, Salem, Mass., assignor to Sawyer Spindle Co.

SPINDLES. Bobbin Clutching Means for Rotatable. 775,850. Frank E. Norcross, Hopedale, Mass., assignor to Sawyer Spindle Co.

SPINNING FRAME Scavenger Roll Support. 775,928. Charles J. Murray, Willimantic, Conn., assignor to himself and John A. Murray, Worcester, Mass.

SPINNING FRAME Separator Mechanism. 777,831. Herbert G. Beede, Pawtucket, R. I.

SPINNING and Doubling Frame Spindle. Self-Contained. 776,410. Henry Meynell, Accrington, England.

SPINNING MACHINE. 775,549. David Alexander and James L. Napier, Glasgow, Scotland.

SPINNING MACHINE. 777,915. Henry A. Owen, Whitinsville, Mass., assignor to The Whitin Machine Works, Whitinsville, Mass.

SPINNING MACHINE Stop Motion. Ring. 777,918. Joseph Poisson, Fall River, Mass., assignor of one-half to Harry C. Lancaster, Fall River, Mass.

SPINNING SPINDLE. 775,681. John E. Prest, Worcester, Mass.

SPINNING SPINDLE. 776,121. George O. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

SPINNING and Twisting Machine Bands. Machine for Making. 778,150. Thomas A. Sizemore, Greenville, S. C.

SPINNING and Winding Machine. Yarn. 776,128. Alfred J. Foulds and Henry A. Foulds, Philadelphia, Pa.

VEILINGS or Other Tulles. Machine for Sizing and Finishing. 776,532. Louis Denis Mornad, Paterson, N. J., assignor to William J. Urchs, New York, N. Y.

WARP CREEL. 777,845. George Crossland, Watertown, Mass.

WOVEN FABRIC. 776,275. David Valentine, Orange, and Thomas W. Bentley, Newton, N. J.

YARN CONE. 778,003. David T. Berlizheimer, Philadelphia, Pa.

C. E. RILEY & CO.

65 Franklin Street, BOSTON, MASS.

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HALL & STELLS, Worsted Machinery.

CONSTRUCTION DE MACHINES, Ci-Devant, F. J. Grun. French Worsted Machinery.

HOYLE & PRESTON, Noble Combs, Back Washing Machines, etc.

JAMES TOMLINSON, Ltd., Cotton Waste Machinery; Engine Cleaning and Hard Waste Breaking Machines, etc.

JOHN HAIGH & SONS, Ltd., Woolen and Worsted Cards, Fearnoughts, Feeds, etc,

THOS. BROADBENT & SONS, Hydro Extractors, Patent Suspended Steam and Electrical Driven, Machines kept in stock in Boston.

JOHN WHITELEY & SONS, Card Clothing for Cotton; Tempered Steel, Plough Ground, Needle Pointed.

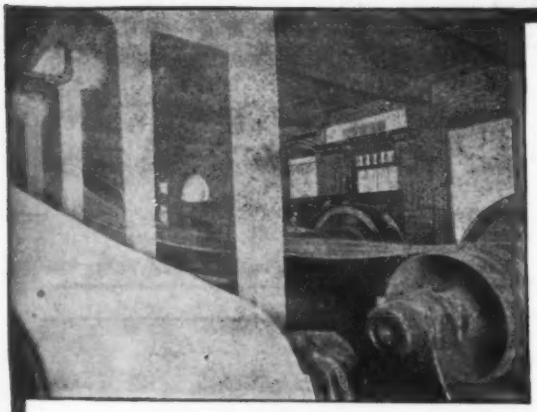
L. M. TETLOW & SONS, Card Clothing for Woolen and Worsted; Tempered Steel, Needle Pointed.

J. GREENHALGH & SONS, Cotton Waste Willows, for Fly, Strips, Picker Droppings, etc.

DRONSFIELD BROS., Ltd., Grinding Rolls and Emery Filleting. Stock kept in Boston.

SPINDLES, FLYERS, FLUTED ROLLS, ETC.

DIRECT .. .. IMPORTERS OF **EGYPTIAN COTTON**



JAMESTOWN, N. Y., Oct. 27, 1904.

CLING-SURFACE CO., Buffalo, N. Y.

GENTLEMEN:—The data herewith explains the conditions of the belts you have photographs of.

Our engine is 1000 H. P. The belts run from two 20 ft. pulleys (62 R. P. M.) to two 31" pulleys (450 R. P. M.) The large belt is 40" face, double leather, on 45 ft. centers. The shorter belt is 40" face, also double leather and on 35 ft. centers. The two belts were doing 500 H. P. when photographed and could do much more.

I have used Cling Surface here for five years and am entirely satisfied with it. These belts are clean, not sticky, pliable and in fine condition and the larger is running with a sag of 4 ft., while the smaller is 22" slack. I believe in slack belts and Cling-Surface permits me to run them so.

Yours very truly,
W. H. COBB, Chief Engr.,
Broadhead Worsted Mills.

Five Years Use in the Broadhead Mills

These big belts are a good example of what Cling-Surface is doing. Don't think of Cling-Surface merely as a material for belts. It is that, but its far reaching results make it a means to a new method of belt management—the easy or slack method, and that means low friction load, economy of oil, babbit, belts, fuel, power, time and trouble.

Get a package therefore and test it—severely.

CLING-SURFACE CO 199-205 Virginia St Buffalo N Y

BOSTON
170 Summer Street

NEW YORK
39 Cortlandt Street

PHILADELPHIA
The Bourse

LUNKENHEIMER

Suitable for all movable bearings, works only while in motion, simple and practical in construction and easily filled without detaching plug. Glass sides show stage of oil. Attach cup so glass sides are parallel with rod. When cup is in motion the oil travels in a body within the cup, and at each revolution is thrown against the feed tube, flowing down through it to the bearing—the centrifugal force, combined with the shape of the body, carrying the oil to the holes in the feed tube. Specify *Lunkenheimer* and order from your dealer. Write for catalog.

THE LUNKENHEIMER COMPANY,
CINCINNATI, OHIO, U. S. A.

CHAMPION ROD OIL CUP

9

New York, 26 Cortlandt St. Philadelphia, 1428-32 Callowhill St. New Orleans, Tulane-Newcomb Bldg. London, 35 Great Dover St. Paris, 24 Boulevard Voltaire.

Buyers' Index.

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisement. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in these classified lists such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Accounting Machine.
Mechanical Accountant Co.

Accountants, Public.
Garry, Brown & Co.

Air Moistening System.
American Moistening Co.
Bell Pure Air & Cooling Co.
Schutte & Koerting Co.

Appraisals.
Audit & Appraisement Co. of America, The.

Architects and Mill Engineers.
Ballinger & Perrott.
Dean & Main.
Ferguson, John W.
Stearns & Castor.
Suck, Adolph.

Auditors.
Garry, Brown & Co.

Automatic Feeds for Cotton and Wool.
American Drying Machinery Co.
Harwood, Geo. S. & Son.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schofield, Wm. Co.
Woonsocket Machine & Press Co.

Balling Machine.
North Chelmsford Machine Co.
Torrance Mfg. Co.

Bandings.
——See under Yarns

Baskets.
Burlington Basket Co.
Lane, W. T. & Bro.
Morris & Co.

Belting.
Houghton, E. F., Co.
Jeffrey Manufacturing Co.
Main Belting Co.
Shultz Belting Co.
——See also Mill Supplies.

Belt Dressing.
Cling Surface Mfg. Co.
Dixon, Jas., Crucible Co.
Houghton, E. F., Co.
Stephenson Mfg. Co.

Belt Lacing Machines.
Diamond Drill & Machinery Co.

Bindings.
——See Tapes and Braids.

Bleaching Kiers.
Allen, William Sons Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Textile Finishing Machinery Co.

Bleaching Materials.
Bosson & Lane.
Roessler & Hasslacher Chemical Co.

Blowers and Blower Systems.
American Blower Co.
Barney Ventilating Fan Works.
Boston Blower Co.
Buffalo Forge Co.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Schutte & Koerting Co.
Sturtevant, B. F., Co.
Schnitzler, Chas. H.

Blowers.
Green Fuel Economizer Co.

Bobbin Covers.
Kolb, Frank E.

Bobbins, Spools, Shuttles, Etc.
Leigh, Evan A.
Tebbets, E. L. & Co.

Boilers.
——See Steam Boilers.

Boiler Arches, "Steel Mixture."
McLeod & Henry.

Boiler Setting.
Harris, J. B.

Boxes, Cloth Boards, Etc.
Pearson, J. T.

Boxes (Paper).
——See Paper Boxes.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Brass (Perforated).
——See under Perforated Metal.

Brushes.
Felton, S. A. & Son Co.
Mason Brush Works.

Brushers.
——See Napping Machines.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.

Burlaps.
Stoddard, Haserick, Richards & Co.

Buttons.
International Button Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W. & Sons Co.
Taunton, New Bedford, Copper Co.
Textile Finishing Mchry. Co.
——See also Dyeing, Bleaching, Machinery, etc.

Canvas Baskets.
Burlington Basket Co.
Lane, W. T. & Bro.
Morris & Co.

Carbonizing.
Riverdale Woolen Co.

Carbonizing Machinery.
American Drying Machinery Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.

Card Clothing.
Ashworth, Elijah.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
Entwistle, T. C., Co.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Roy, B. S. & Son.
Stoddard, Haserick, Richards & Co.

Carders' Tools.
Brown, W. H.

Carpet Machinery.
Altemus, Jacob K.
Curtis & Marble Machine Co.
Philadelphia Textile Machinery Co.

Castings.
Link Belt Engineering Co.
Lunkenheimer Co.
Schofield, Wm., Co.

Chemicals.
Grasselli Chemical Co.
Klabfleisch, Franklin H. & Co.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.

Chemists.
Little & Walker.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Pettes & Randall Co.
Riggs & Brothers.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Shryock, J. K.
Smyth, J. L. N. Paper Co.

Cloth Stretchers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Textile Finishing Machinery Co.

Clutches.
American Tool & Machine Co.
Carlyle-Johnson Machine Co.
Hunter, James, Machine Co.
Klein, Chas. C.
Reeves Pulley Co.

Combs (Wool and Cotton).
Hood, R. H.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Combustion System.
Harris, J. B.

Conveyors, Pneumatic.
——See Blowers & Blower Systems.

Conveying Machinery and Chains.
Jeffrey Manufacturing Co.
Link Belt Engineering Co.

Cop Tubes.
——See Paper Tubes.

Copper (Perforated).
——See under Perforated Metal.

Copper Print Rollers.
Taunton, New Bedford Copper Co.

Coppersmiths.
Badger, E. B. & Sons Co.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

Cotton.
Blaisdell, S., Jr., Co.
Charles, W. B.
Riley, C. E. & Co.
Stoddard, Haserick, Richards Co.

Alphabetical Advertising Index, with page numbers, follows this list.

Cotton Elevators.
Buffalo Forge Co.

Cotton Machinery.
Altemus, Jacob K.
Atherton, A. T., Machine Co.
American Drying Machinery Co.

Mercerizing Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., & Sons.
Ashworth, Elijah.
Baker Machine Co.
Barker, James.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Cohoes Foundry & Machine Co.
Coldwell-Gildard Co.
Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
Entwistle, T. C., Co.
Firth, William, Co.
Houghton, L. T.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kitson Machine Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Metallic Drawing Roll Co., The.
Neversiip Cop Spindle Co.
North Chelmsford Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Providence Machine Co.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.
Schaellibaum, Robert, Company.
Schofield, Geo. L.
Stoddard, Haserick, Richards & Co.
Textile Appliances, Ltd.
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Atherton, A. T., Machine Co.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.
Warren Soap Mfg. Co.

Cotton Waste.
Becker, C. W.
Blaisdell, S., Jr., Co.
Charles, W. B.
Greaves, Frank B.

Crayons.
Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Cutter for Knit Goods.
Eastman Machine Co.
Langston, Samuel M.

Cutting Machinery.
Eastman Machine Co.

Dating and Time Stamps.
Riggs & Brothers.

Dextrine.
Stein, Hirsh & Co.

Dobbies.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.

Drawing Rolls.
Hood, R. H.
Metallic Drawing Roll Co., The.

Dryers.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks (Arthur Birch, prop.)
Birch, Arthur, Arlington Machine Works.
Boston Blower Co.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.
Vacuum Process Co.

Drying Boards.
Bull, William C.
Pearson, J. T.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co.
Philadelphia Drying Machinery Co.

Dyers, Bleachers and Finishers.
Brophy's, T., Sons.
Cranston Worsted Mills (yarns).
Davidson, J. F.
Firth & Foster Co.
Greenwood, R. & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Keystone Fast Black Dye Works.
Lawrence Dye Works.
Lorimer's, The Wm. H. & Sons Co.
Molt Bros. (Indigo Blue).
Pawtucket Dyeing & Bleaching Co.
Phoenix Steam Dye Works.
Providence Mills Mfg. Co.
Rowland, Samuel.

Dyeing, Drying, Bleaching and Finishing Machinery.
Allen, William Sons Co.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Machine Works.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Fabric Measuring & Packaging Co.
Fearon, E., Co.
Gessner, David.
Heathcote, John & Son.
Heusch, Severin.
Hopkins Machine Works.
Kenyon, D. R. & Son.
Klauder-Weldon Dyeing Machine Co.
Klipstein, A. & Co.
Leigh, Evan A.
Leyland, Thos. & Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Smith, Drum & Co.
Smith's, John E., Sons.
Stiner, Frank.
Sturtevant, B. F., Co. (Drying).
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Vacuum Process Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.

Dye House Cans.
Hill, James, Mfg. Co.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dyestuffs and Chemicals.
Atteaux, F. E. & Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Grasselli Chemical Co.
Kalle & Co.
Farbenfabriken of Elberfeld Co.
Ford, J. B., Co.
Geigy Aniline & Extract Co.
Geisenheimer & Co.
Johnson, Chas. A. & Co.
Klabfleisch, Franklin H. & Co.
Klipstein, A. & Co.
Kuttroff, Pickhardt & Co.
Leyland, Thos. & Co.
Metz, H. A. & Co.
Molt Bros. (Indigo Blue).
Nicol, J. M. & J. S.
Roessler & Hasslacher Chemical Co.
Selling Co., The.
Solvay Process Co.
Sykes & Street.
Thayer, Ed. M.
Vila, H. S.

Dynamos and Motors.
Allis Chalmers Company.
General Electric Co.
Mechanical Appliance Co.
Sturtevant, B. F., Co.

Edgings.
——See Tapes, Braids and Edgings.

Electrical Construction.
Allis Chalmers Company.
Electro-Dynamic Co.
General Electric Co.
Mechanical Appliance Co.
National Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Cloth Cutter.
Eastman Machine Co.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
General Electric Co.
Mass. Fan Co.
Mechanical Appliance Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Lamps.
Sturtevant, B. F., Company.

Electric Lighting.
Allis Chalmers Company.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Motors.
Allis Chalmers Company.
Crocker-Wheeler Co.
Electro-Dynamic Co.
General Electric Co.
Mechanical Appliance Co.
National Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Elevators.
Cohoes Foundry & Machine Co.
Jeffrey Manufacturing Co.
Morse, Williams & Co.
Salem Elevator Works.

Employees' Time Recorders.
Pettes & Randall Co.
Riggs & Brothers.

Engravers.
Smith Bros.

Exhaust Heads.
Sturtevant, B. F., Co.

Expert Accountants.
Garry, Brown & Co.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus.

Fans.
Green Fuel Economizer Co.

Feed Water Heaters.
Green Fuel Economizer Co.
Scaife, W. B. & Sons.

Feed Water Pumps.
Gouids Mfg. Co.
Scaife, W. B. & Sons.

Feed Water Purifiers.
Philadelphia Water Purification Co.

Feeds.
——See Automatic Feeds.

Filters.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Scaife, W. B. & Sons.

Finishing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Fire Box Blocks, "Steel Mixture."
McLeod & Henry Co.

Fire Brick.
Borgner, Cyrus, Co.
McLeod & Henry.

Fire Extinguishers.
Badger, E. B. & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Alphabetical Advertising Index, with page numbers, follows this list.

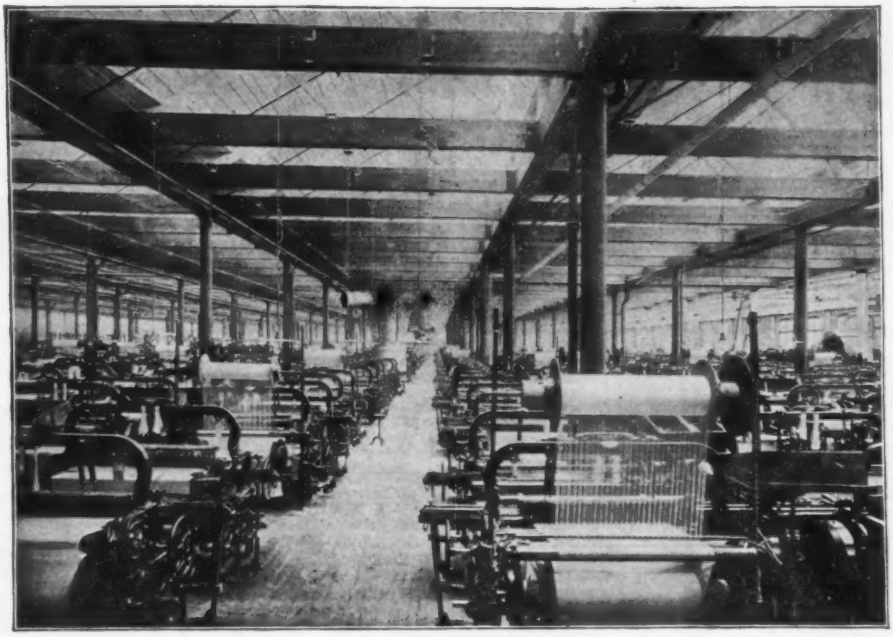
TEXTILE MILLS

are thoroughly and economically

Heated and Ventilated

by the

STURTEVANT SYSTEM



WEAVE SHED, SOULE MILL, NEW BEDFORD, MASS.

This extensive weave shed is heated and ventilated by the Sturtevant System. Two stand pipes admit air under pressure and distribute it throughout the building; equal heating results. With this system exhaust steam is utilized, humidity regulated and the quantity and quality of the air varied at will. There are no scattered steam pipes, the whole apparatus being centralized and under one man's control.

New York
Philadelphia

B. F. STURTEVANT CO.

Chicago
London

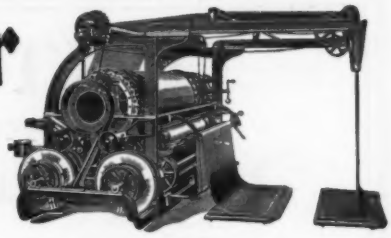
BOSTON, MASSACHUSETTS

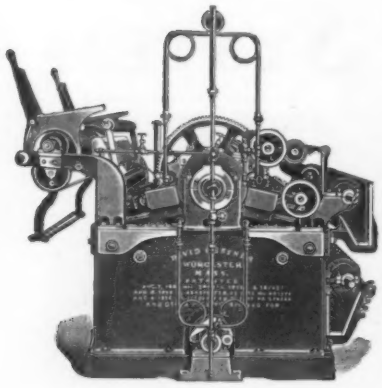
General Office and Works, Hyde Park, Mass.

370

David Gessner

Worcester, Mass.

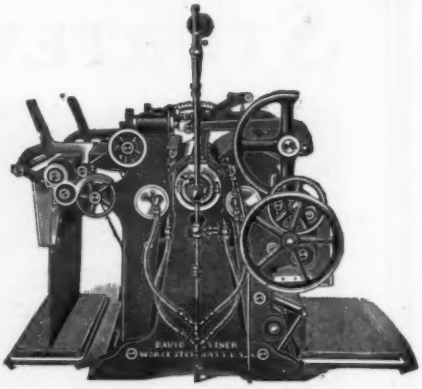




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Fire Proof Doors and Windows.
Badger, E. B., & Sons Co.
Lupton's, David, Sons Co.

Flax, Tow, Hemp and Jute Machinery.
Fairbairn-Lawson-Combes-Barlour, Ltd.
Haskell-Dawes Mach. Co.
Leigh, Evan A.

Fluted Rolls.
Hood, R. H.
Leigh, Evan A.
Riley, C. E. & Co.
Thurston, A. G. & Son.

Flyers.
Leigh, Evan A.
Textile Machinery Co.

Forges.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Forwarders.
McKeon, John F.

Friction Clutches.
—See Clutches.

Friction Cones.
Evans, G. Frank.

Fuel Economizers.
Green Fuel Economizer Co.

Furnace for Boilers.
Harris, J. B.

Fulling Mills for Woolen Goods.
Hopkins Machine Works.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.

Garnetts.
Leigh, Evan A.
Philadelphia Textile Machinery Co.

Gas Engines.
Jones, Lewis.

Gas Exhausters.
Sturtevant, B. F., Co.

Gauges.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Walworth Manufacturing Co.

Gears.
New Process Raw Hide Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Grids for Cotton Openers.
Schaellibaum, Robert, Company.

Heating.
—See Ventilating.

Heddles.
Steel Heddle Mfg. Co.
Stoddard, Haserick, Richards & Co.

Hoists and Hoisting Machinery.
Larrabee, John E.

Humidifying Apparatus.
American Air Moistening Co.

Hydro Extractors.
American Tool & Machine Co.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.

Injectors.
Lunkenheimer Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Jacquards.
Halton's, Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Cathcart, John & Co.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger Mfg. Co.
Hepner & Horwitz.
International Button Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
Craw, J. W., Laundry Machinery Co.
Eastman Machine Co.
Langston, Samuel M.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Branson Machine Co.
Paxton & O'Neill.
Stafford & Holt.
Stanton & Lewis.

Knitting Machinery.
Boss Knitting Machine Co.
Branson Machine Co.
Brinton, H. & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Grosser Knitting Machine Co.
Jeuckes, E., Mfg. Co.
Jones, Lewis.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
McMichael, A.
National Automatic Knitter Co.
Newton, E. A.
Nye & Tredick Co.
Paxton & O'Neill.
Quaker City Stop Motion Co.
Richter, Wolfgang.
Ruth Machine Co.
Scott & Williams.
Seyfert & Donner.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walther, Otto.
Wildman Mfg. Co.

Alphabetical Advertising Index, with page numbers, follows this list.

THE NEW

CROMPTON-THAYER LOOM COMPANY

MANUFACTURERS OF

FANCY LOOMS

For Weaving Worsted and Woolen, Fancy Cottons and Silk Fabrics.

DOBBIES, BOX MOTIONS AND SUPPLIES.

Works and Offices; **677 Cambridge Street, Worcester, Mass.**

Knitting Needles and Supplies.
Branson Machine Co.
Breedon's, Wm., Son.
Brinton, H. & Co.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Excelsior Needle Co.
Gormley, R. W. & Co.
Grosser Knitting Machine Co.
Ives, Loyal T.
Kolb, Frank E.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Treat, Orion.
Wardwell Needle Co.

Labeling Machines.
Beck, Chas., Paper Co., Ltd.

Lamps, Incandescent.
General Electric Co.
Sawyer-Mann Electric Co.
Westinghouse Electric & Mfg. Co.

Lathes.
McCabe, J. J.

Leather.
Houghton, E. F., Co.

Logs and Lumber.
Bass, E. L.

Loom Pickers.
Garland Mfg. Co.

Looms.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Draper Company.
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Hepworth, John W. & Co.
Leighton Machine Co.

Lubricators.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.

Lumpers.
Gerry, George & Son.
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Lamb, J. K., Textile Mach. Co.
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Stead, Arthur
Taylor, James.

Machinists' Tools.
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McCabe, J. J.
Whiton, The D. E. Co.

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Measuring and Folding Machines.
Elliott & Hall.
Fabric Measuring & Packaging Co.

Mechanical Draft.
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Massachusetts Fan Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
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Buffalo Forge Co.
Dean & Main.
Philadelphia Drying Machinery Co.
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Suck, Adolph.

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Greenwood & Bault, R.
Home Bleach & Dye Works.
Lorrimer, Wm. H., Sons Co.
Klauder-Weldon Dyeing Machine Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.

Metallic Fire-proof Window Frames and Sashes.
Badger, E. B., & Sons Co.
Lupton's, David, Sons Co.

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Bamford & Smith.
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Buckley's, Benj., Sons., Gun Mill.
Burlington Basket Co.
Crosby Steam Gage and Valve Co.
Dixon Lubricating Saddle Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
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Jefferson, Ed., & Bro.
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Kolb, Frank E.
Lane, W. T., & Bro.
Larrabee, John E.
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Morris & Co.
Murphy, E. W., & Co.
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Stephenson Mfg. Co.
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Tucker, W. W. & C. F.
United States Supply Co.
Ward & Vandegrift.
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Ryle, Wm., & Co.

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Lunkenheimer Co.
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Murphy, E. W., & Co.
New York & New Jersey Lubricant Co.
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Crosby & Gregory.
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Roessler & Hasslacher Chemical Co.

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Walder, J.

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Walworth Mfg. Co

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Cheney Bros.

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Lincoln Water Proof Cloth Co.
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Speed & Stephenson.

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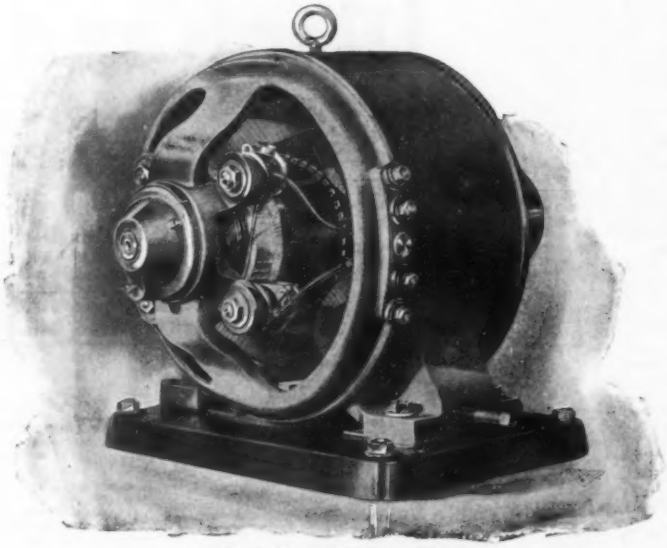

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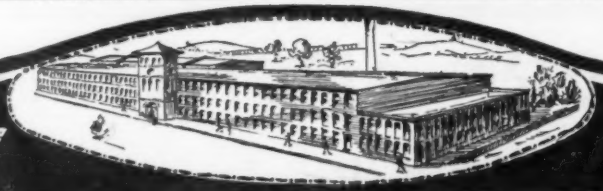

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A General Manager for a Cotton Mill

In the South, Manufacturing Colored Goods.

Equipment consists of 400 looms and 12,000 spindles. Must be highly recommended and a first-class man in every particular. Address, J. A. PRIOR, care Frederick, Victor & Achelis, Leonard Street, corner Church, New York City.

Wanted. An Experienced Knitter who understands the McMichael & Wildman, also Nye & Tredick rib machines, to take full charge of knitting room. State particulars, wages, etc. Address Textile Mfg. Co., 258-260 E. Division St., Chicago, Ill.

Knitting Superintendent Wanted. For a Canadian mill making ladies' ribbed underwear. State experience, wages expected and references. Address Underwear, care Textile World Record, Boston.

Knitting Machine Agency.

After January 1st, Mr. Frank Reichenbach is no longer agent for the GROSSER KNITTING MACHINE Co., for Philadelphia and the State of Pennsylvania. **Active agents wanted in all industrial centres.** THE GROSSER KNITTING MACHINE Co., Max Nydegger, 260 W. Broadway, New York.

Wanted. Experienced Foreman for Knitting Machinery and general machine work. State experience and salary expected. Address Box M, Little Falls, N. Y.

Wanted. Man to take charge of Spooling and Winding room of spool cotton manufacture. State age and salary expected. Address "Spool Cotton," Textile World Record, Boston.

SITUATIONS WANTED.

Foreman Latch Needle Knitter. Twelve years' experience on men's women's and children's underwear, plaited, straight and shaped work. Worked on S. & W., N. & T., Champion, S. & H., and McM. & W. machines. 32 years old; American; married. Best of references. Address Foreman, Textile World Record, Boston.

Expert on Costs and office manager desires to change present position and connect himself with a large textile manufacturer. A 1 accountant and up to date. Can show results. Address "Textile Costs," Textile World Record, Boston.

Wanted. Position by First Class Dyer. Fifteen years' experience on raw stock, wool, cotton, shoddy, cross dyes and all kinds of piece dyeing. Age 35 years. Temperate and good manager of help. First class references. Address Box 28, Textile World Record, Boston.

Position Wanted. By a thoroughly experienced bleacher and dyer of cotton, cotton and wool mixtures, mercerized and wool, all fibres bleached successfully with Peroxide of Sodium process, A1 reference, married, terms moderate, will not go West or to Canada. Address "Bleacher," Textile World Record, Boston.

SITUATIONS WANTED.

Thefollowing advertisements are a portion of those of superintendents and overseers of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Any paid-in-advance subscriber may have his name placed on the list of those desiring positions, upon filling out the requisite blanks, furnished upon request. Correspondence is confidential.

COTTON SUPERINTENDENTS.

Superintendent Cotton Mill open to a position. Age 33; American; married. Good experience as overseer of carding in large mills. Combed and carded hosiery yarns, shirtings, sheetings, cheviots, madras. First-class references. 2096, Textile World Record.

Superintendent of broad silk mill wants position. Age 39; English; married. Worked on mostly plain goods. Could be of good service to some reliable concern just starting up. Has small plant of his own which he would put in as stock with a first-class concern. 3154, Textile World Record.

Superintendent. Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Cotton Mill Superintendent. Age 38; Scotch; married. All counts of American and Egyptian cotton from 10 to 60, twist and weft, warps, beams, and bundles and crape yarns, super quality. Familiar with Platt, Asa Lee, Howard & Bullough, Hetherington and Brooks & Doxey machinery. First-class references. 3042, Textile World Record.

Overseer of Cotton Carding. Age 32; married. Carded and combed yarn, fine and coarse, lenos, lawns, shirtings. English and American makes of machinery. References. 3025, Textile World Record.

Cotton Mill Superintendent, or assistant. Age 34, married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 3003, Textile World Record.

Assistant Superintendent or boss weaver of cotton mill. Twenty-five years' experience. Unquestionable references as to character and ability. Thoroughly acquainted with plain, fancy box or lappet looms. Can take place on short notice. 3034, Textile World Record.

Superintendent of Cotton Yarn Mill or duck mill. A young man; American; married. Prefers position in the South. Worked in different departments, spinning, spooling, twisting, warping, reeling and balling and now ready for a superintendent's place. Unquestionable references. 3087, Textile World Record.

Superintendency of cotton mill wanted by a thoroughly practical cotton manufacturer of over 20 years' experience. Age 38; married. Temperate. Good manager. Fully competent to obtain full production at minimum cost and maintain best selling qualities. Highest references given. 1236, Textile World Record.

Superintendent. All kinds of fancy cotton, white and colored, plain and fancy, jacquard and box work, also silks and worsteds. Would take good overseer of weaving position. 3120, Textile World Record.

Superintendent or assistant. Leno, plain and fancy ginghams and sheetings. Wants place at once. 3162, Textile World Record.

Overseer or superintendent. American. Married. Ginghams, madras, cheviots, dress goods. Good experience and first-class character. 3164 Textile World Record.

WOOLEN SUPERINTENDENTS.

General Manager, agent, superintendent or designer. Worked on everything from fine worsted to a blanket. Good experience. Aged 37; American; married. 3172, Textile World Record.

Superintendent. Has made yarn and shoddies and about everything in woolen line. Good general knowledge of woolen manufacture. Familiar with English, Belgium and American carding, spinning and preparatory machinery. 3088, Textile World Record.

Superintendent or assistant superintendent wants position. Age 31; American; married. Good experience on all kinds of goods, especially on union and satinets. Good references. Six years' experience in present place, five as overseer and one as superintendent. 3139, Textile World Record.

Superintendent or Designer. Age 37. English. Married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

Superintendent, manager or designer. Age 37; English; married. Worsted and woolen goods for men's wear and rain cloths. Worked in English mills, and has also been employed in this country. 3103, Textile World Record.

Superintendent, age 34; American; married. Worked on fancy woolens. Not employed, and can take position at once. Will not go to Canada or West or South. Would take a good boss spinner place or assistant superintendent, but wants over $4.00 per day. 3104, Textile World Record.

Superintendent or designer of small or medium sized mill. All kinds of fancy worsteds, cassimeres, cheviots, overcoatings and dress goods. Age 31; married; Scotch. 3076, Textile World Record.

Superintendent or boss weaver. 15 years' experience in worsted, woolen and silk goods. Graduate of Philadelphia Textile School. 32 years old; married. Good manager of help. American. 3119, Textile World Record.

Superintendent. Age 37; American; married. Woolen dress goods, fancy cassimeres, cloakings, etc. Will not go West, South or to Canada. First-class references. Graduate of Philadelphia Textile School, and also had good practical experience. 3126, Textile World Record.

Superintendent and designer, or assistant superintendent. Age 34; married. Worked on cloths ranging from all cotton to all wool and worsteds, such as cotton worsteds, jeans, army cloths, kerseys, etc. Excellent references. 3148, Textile World Record.

Superintendent and Designer. Age 30; American; married. Cotton warp, worsted and silk vestings, tapestry curtains, plaid backs, broadcloth, etc. 3146, Textile World Record.

Superintendent. Age 37; American; married. Woolen dress goods, fancy cassimeres, cloakings, etc. First-class references. Graduate of Philadelphia Textile School, and also 18 years' practical experience. 3126, Textile World Record.

Superintendent. American; married. Worked on cassimeres, dress goods, cotton warps, and has had some experience on worsteds. Will go anywhere, but would like a good Western mill. Good experience. 3034, Textile World Record.

Superintendent or Designer. Age 37; American; married. All grades of woolens and also cotton warp goods. Will not go South or to Canada. 3124, Textile World Record.

COTTON CARDERS.

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

Overseer of Carding. Large experience on all kinds of work and both English and American systems. Can furnish first-class references. Had charge of carding in some of the best New England mills. 3009, Textile World Record.

Overseer of Carding or cotton ring spinning. Worked on carded and combed Peelers, Egyptian, and Sea Island cottons, making yarns from 8 to 80. 3015, Textile World Record.

Overseer of Carding. Has held all positions in picker and card rooms. White and colored goods, 8s to 40s. 3070, Textile World Record.

Overseer of Carding Mill. All kinds of fine yarns. Started up two of the largest card rooms in New England. Considered an expert in the manufacture of combed yarns from the bale to the finished article. First-class recommendations. 1745, Textile World Rcord.

Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. Will not go West or South. 3061, Textile World Record.

Overseer of Carding or Ring Spinning. Age 35; American. Sheetings, prin s and yarns, coarse and fine. Worked on most American machinery, but is more familiar with Lowell & Whitin. 1915, Textile World Record.

Overseer of Carding or Superintendent. Wide experience in large mills. Age 42; married. Finest of references. Will take large carding or superintendency. Familiar with all counts. 3133, Textile World Record.

Overseer or secondhand in preparatory department of long chain beaming, quilling, tape dressing, warping and spooling. A Scotchman; married. Will not go West or South. 3156, Textile World Record.

WOOLEN CARDERS.

Overseer for Washing, Carding or Combing wool for worsted wants to better himself. Speaks German, French and English. Best of references. 2083, Textile World Record.

Carder, or carder and spinner. German; married. Worked on all wool, wool and cotton, and shoddy mixes. Ten years' actual experience, and can furnish first-class recommendations. 2057, Textile World Record.

Overseer of Woolen Carding. Worked on all wool, wool and shoddy, wool, shoddy and noils. Wants $4 a day. Familiar with Davis & Furber, Furbush, Lombard and Bollette and Brown Patent. 3071, Textile World Record.

Overseer of Combing, washing, carding. Age 36, English, married. All classes of wool. Good experience and first-class recommendation. 3094, Textile World Record.

Overseer of Woolen Carding. Would accept secondhand position. All wool, cotton and wool, shoddies, mixes, worsteds. Does not wish for position on shoddy, but would consider one. Blankets, suitings, flannels. Understands spinning. 3093, Textile World Record.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

Overseer of Carding. Age 30; American married; Nearly all classes of goods. Good experience and references. Address 3170, Textile World Record, Boston.

Boss Carder. Union cassimeres, beavers, French. First-class recommendations. Not employed, and wants place at once. 3174, Textile World Record.

COTTON SPINNERS.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yar ranging from 24's to 160's is open to a position. .. years old; American. Good references. 2003, Textile World Record.

Overseer Ring Spinning, or asst. superintendent. Sea Island combed from 6s to 30s, American from 6s to 50s; in fact, all grades of cotton, also expert on cable yarn. Prefers South, but will go anywhere. Wants $3.50 per day to begin with. 2020, Textile World Record.

Boss Ring or Mule Spinner. Age 43; English; married. Asa Lee mules, Lowell Machine Shop, Platt, Mason mules; Howard & Bullough, Lowell and Mason frames. Yarns from 5's to 90's. 3001, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer Ring Spinning, spooling and warping wishes a position. A married man, with good experience. Worked on sheetings, shirtings, jeans, grain bags. 3152, Textile World Record.

Supt. of Cotton Mill, or overseer of mule or ring spinning is open to a position; 16 years' experience in Northern mills, on yarns, denims, awnings, apron checks, bicycle suitings, shirtings, etc., etc. Familiar with all well-known makes of cotton machinery; 29 years old; American; married. Can give references from large Massachusetts mills. 1527, Textile World Record.

Overseer of Cone Winding and spooling or ring spinning, who understands Universal, Foster, Broadbent and Payne winders, and Whitin and Mason frames, desires a position. Has worked on carded and combed yarns from 4's to 160's; also, mercerized, gassed and bleached yarns from 2 to 8 ply. Young man; American; married, and can give satisfactory references from large mills. 1960, Textile World Record.

Overseer of Spooling, warping, beaming, slashing and web drawing. Age 37; married. 3010, Textile World Record.

Overseer of Spinning. Age 34; married. Good experience. 20s to 90s Egyptian and American cotton. 3125, Textile World Record.

WOOLEN SPINNERS.

Roll Coverer wants an opening for work. Can cover cotton or worsted rolls, make aprons, or better, has had large experience. Can furnish tools. Work by piece or day. 1803, Textile World Record.

Superintendent woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills. 2023, Textile World Record.

Overseer of Warping, Spooling and Winding. Dress goods and cloth. Will not go to Canada. Aged 40; married. Good experience. References. 3027, Textile World Record.

Woolen Finisher. First-class. Familiar with all classes of goods and machinery. Can take full charge from loom to case. Has always been very successful. 1244, Textile World Record.

Boss Spinner. Age 34; Scotch. Worked on all wool, cotton and wool and shoddy mixes. Will not go West, South or to Canada. References. Good experience. 3032, Textile World Record.

Overseer Woolen Spinning. Cassimeres, beavers, kerseys, dress goods, flannels, etc. Good experience. 3177, Textile World Record.

COTTON WEAVERS.

Superintendent of cotton weaving and spinning mill. English. Quilts, damasks, brocades, ribbons, etc. 3175, Textile World Record.

Overseer of Weaving. Englishman; 33 years of age; married. Worked on fine lawns, sheetings, sateens and fancies, coarse drills, twills, bicycle cloth, automobile cloth for tires. Familiar with Whitin, Crompton, Knowles, Mason, Kilburn & Lincoln and Lowell machines. 3073, Textile World Record.

Overseer Cotton Weaving. Plain and a variety of fancies, lenos, etc. Good experience. A young man; English; married. 3147, Textile World Record.

Overseer of plain cotton weaving. Age 27; American; married. Familiar with Whitin, Mason, Colvin and Draper looms. Worked on prints, sheetings, cambrics, lawns, twills, etc. 3143, Textile World Record.

Overseer of Weaving. Sheetings, sateens, ginghams, and dimities. Will not go South. 3116, Textile World Record.

Overseer of Weaving. Worked on sheetings, twills, sateens and fancies. Wants not less than $18 per week. 3157, Textile World Record.

Practical Boss Weaver and loom fixer wants position. Good and long experience. Good record for big production; good quality and for being a good manager of help, and the getting and keeping plenty of good hands. A sober and steady man. Will go anywhere. Either cotton, woolen or jute. 1806, Textile World Record.

WOOLEN WEAVERS.

Overseer of Weaving, also designer. Men's wear, woolen and worsted, and fancies of all kinds, cotton worsteds, dress goods. Knowles and Crompton looms. Age 35. 3056, Textile World Record.

Overseer of Weaving, or would take good second hand job. Age 42; married. Worked on dress goods, suitings, plaid backs, cloakings, meltons and other classes of goods. Worked on Crompton & Knowles loom. 3016, Textile World Record.

Boss Weaver or assistant superintendent. Worked on all kinds of worsteds and woolens. Crompton & Knowles looms. Wants place at once. Middle aged; English; married. Good experience. Excellent references. 3062, Textile World Record.

Boss Weaver. Aged 38; married. Cassimeres, beavers, kerseys, dress goods, flannels, blankets. Worked on Crompton & Knowles broad looms. Good recommendation. 3066, Textile World Record.

Overseer of Woolen Weaving, or would take a secondhand job. 35 years old; married. Familiar with Crompton & Knowles looms. Good references. 3089, Textile World Record.

Overseer of Weaving or designer. Age 29; American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation. 2051, Textile World Record.

Boss Weaver wants position. Very wide experience. White and colored, plain and fancy. Understands all kinds of looms. 335, Textile World Record.

Overseer of Weaving. Worked on all kinds of fancy dress goods, cotton, worsted and woolen, also men's wear. Age 31; English; unmarried. 3159, Textile World Record.

Overseer of Weave Room, designer or assistant superintendent. Wide experience. Cassimeres, dress goods, blankets, flannels, etc. All patterns of Knowles & Crompton looms, Davis & Furber, spooling, dressing and weaving machinery, Worcester warp compressor. 1838, Textile World Record.

DYERS.

Secondhand Dyer. Cotton piece and cotton interwoven with paper. Experience with all classes of goods on a small scale. Aged 23; German descent; unmarried. Address 3171, Textile World Record, Boston.

Boss Dyer. Scotch; married. Good references. Bleaching, scouring, dyeing and carbonizing in roll or the garment. Raw stock, cotton or wool. Has worked on ginghams, eiderdowns, knit goods. Will not go South or to Canada. 3149, Textile World Record.

Dyer or superintendent of dyeing and finishing. Age 34; English; married. Not less than $3.50 per day. All classes of woolen, worsted, mixed and cotton piece goods, bleaching, mercerizing. Can take charge from loom to case. 3121, Textile World Record.

Boss Dyer. A young man; married; American. Worked on wool, shoddy, cotton, silk noils, rags, camel's hair and piece dyes on satinets. Will accept $2 per day to start. 3122, Textile World Record.

Superintendent of cotton bleachery is open to a position. Excellent experience. American; married; aged 37. Familiar with cambrics, sheetings, shirtings, lawns, sateens, drilling and fancy weaves. 3153, Textile World Record.

Fancy Dyer. Aged 37; American; married. Cotton, wool and silk. 3158, Textile World Record.

Overseer of Dyeing. Men's wear and dress goods, loose wool, piece dyes and yarns. Good experience. 3161, Textile World Record.

Dyer. Worked on piece dyes, wool, cotton, shoddy yarns, rags and union dyes and carbonizing. Wants place at once. Good experience and references. 3092, Textile World Record.

Wanted, position as boss dyer and bleacher of cotton yarns, long and short chain and skein yarn. Good references. 3145, Textile World Record.

FINISHERS.

Finisher and assistant superintendent wants position. Age 31; American; married. Good experience on all kinds of goods, especially on unions and satinets. Good references. Will not go West, South or to Canada. 3139, Textile World Record.

Boss Finisher. 25 years' experience on all classes of goods, woolen and worsted and cotton mixtures of all grades. 3142, Textile World Record.

Boss Finisher. American. Cheviots, cassimeres, beavers, dress goods, etc. Wants $2.50 to $3 per day. 3123, Textile World Record.

Overseer of Finishing. Age 32; American; married. All grades of worsted and woolens. Good experience. Address 3167, Textile World Record, Boston.

Overseer of Finishing Room. Cut and full fashioned balbriggan ribbed goods. Familiar with Union Special, Wheeler & Wilson, Willcox & Gibbs, Merrow, etc. Excellent references. Address 3168, Textile World Record, Boston.

Woolen Finisher. Age 35; American; married; Wants $2.50 or $3.00 per day. Good experience. 3138, Textile World Record.

Overseer of Cloth Room. Age 37; American; married. Wants $18 per week or over. 3110, Textile World Record.

Overseer of Finishing. Age 33; American; married. Meltons, coverts, cheviots, flannels, mohairs, etc. Wants position in New England, preferably Rhode Island. 3129, Textile World Record, Boston.

Foreman of cotton finishing room. Eight years' practical experience on napping machines, starching and calendering. Worked in mills in Italy and America. Married. 3155, Textile World Record.

KNITTERS.

Knitting Fixer. A young man; American. Ribbed and seamless hosiery, cotton, lisle and Egyptian yarns. Familiar with McMichael & Wildman ribbers, Paxton & O'Neill and Branson 3/4 automatic and Hepworth loopers. Will not go South. 3130, Textile World Record.

Boss knitter, sewing machine fixer. Age 28; American. All classes of ladies' and children's knit underwear made on circular latch needle machines. Wants place at once. 3102, Textile World Record.

General Manager or superintendent of ribbed underwear mill. American; married. Been in underwear business eleven years as superintendent and manager. First-class references as to character and ability. 3100, Textile World Record.

Latch Needle Knitter on N. & T., S. & H., S. & W., McM. & W., Pepper, Lewis Jones, etc., circular machines. Twelve years' experience as boss knitter and superintendent. Wants steady work. Sober, good manager of help, best of references. 3106, Textile World Record.

Boss Knitter or fixer. Would like to work with boss finisher on sewing machines. American; age 32. Familiar with McMichael & Wildman, Nye & Tredick, Snyder & Fisher, Scott & Williams and other makes of latch needle machines, Tompkins spring needle machines, and understands winding. 3118, Textile World Record.

Position wanted in charge of boarding, pressing, pairing, folding of hosiery, etc. First-class references. 3105, Textile World Record.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania. 3037, Textile World Record.

Superintendent of an underwear mill. English; married; middle aged. 3176, Textile World Record.

Boss Knitter or foreman, for seamless hosiery. Several years' experience on all grades, and understands the fixing and care of most all kinds seamless hosiery machinery. 3078, Textile World Record.

Boss Knitter or Sewing Machine Fixer. German; married. Familiar with all makes of knitting and finishing machines on ladies' underwear. Will not go South or to Canada. 3128, Textile World Record.

Superintendent or Manager of large hosiery yarn mill will be open to a position shortly. American; married. Has manufactured in the South hosiery yarns in natural stats, mixtures, silver grays, bleached and colored. Can refer to influential men. 1961, Textile World Record.

Superintendent. All grades and weights of hosiery and ladies' ribbed underwear. Is familiar with Standard, Boss, Nye & Tredick and Branson machines. 598, Textile World Record.

Superintendent knitting mill. Cotton and wool hosiery, heavy mittens, sweaters, toques. Good experience. Aged 45; married. 1291, Textile World Record.

Asst. Superintendent or Boss Knitter. Age 29, strictly temperate and held position of boss knitter for past four years running. Fleeces, balbriggan and flat work on spring needles, and plaited, straight and shaped work on several makes of latch needles. Can give best of references. 1492, Textile World Record.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania or Western States. 3037, Textile World Record.

DESIGNERS.

Designer or superintendent. Age 37; English; married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Wants $30 to $40 per week. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

Assistant Designer or assistant superintendent. Young man; American. Men's wear, ladies' dress goods, shirtings, silk brocades, etc. Graduate of Philadelphia Textile School, and also has had short experience in mill. 3160, Textile World Record.

Designer or assistant. Worked on woolen and worsteds, cotton worsteds and mercerized goods. Good experience. A young man, single, Swede. 3127, Textile World Record.

Designer or superintendent. A German, 26 years of age. Dress goods and men's wear. Experienced in Germany and this country. 3163, Textile World Record.

Assistant Designer or assistant superintendent of woolen or worsted mill. A young man; American; unmarried. Men's wear, dress goods, silk brocades, damask, etc. 3160, Textile World Record.

Designer, assistant designer or assistant superintendent. German. Woolen and worsted men's wear and ladies' dress goods. Experienced in Germany and a short time in this country. 3166, Textile World Record.

Designer or superintendent. Ginghams, crepe, jacquards, cycle tires, filter cloths, vesting cloth, etc. Good recommendations. Middle aged man; English; married. Address 3169, Textile World Record, Boston.

Jacquard Designer wants position or temporary work. Prefers designing for Jacquard blankets if possible. 3167, Textile World Record.

Designer for cotton, worsted and silkoline dress goods and cotton trouserings, etc. A young man; American. 3173, Textile World Record.

MISCELLANEOUS.

Asst. Superintendent of dyeing, printing and finishing plant. Experienced in cotton and silk and capable of turning out finished product. American; 27 and married. Best of references. 3136, Textile World Record.

Second Boss or in advisory capacity for jacquard weaving. Familiar with almost every line of silk fabrics, also cotton backs, tapestry and upholstery goods, hammocks, table and bed covers, ribbons, etc. 3135, Textile World Record.

Loom Boss or asst. superintendent. All kinds of worsted goods for ladies' and gentlemen's wear and various classes of cotton goods. Worked in English mills and also in this country. 3151, Textile World Record.

Loom Boss. Age 32; American; married. Also a designer. Knowles, Crompton, Jacquard and dobby looms. Wants $3 per day. 3150, Textile World Record.

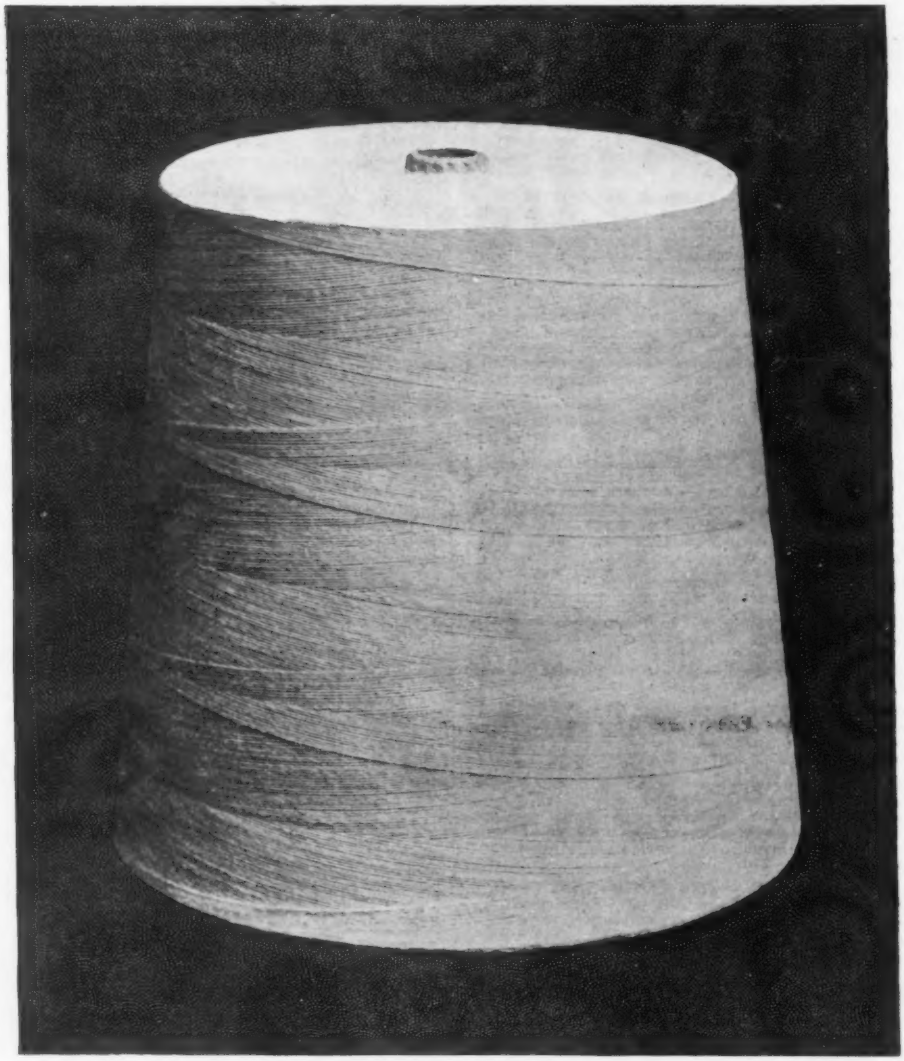
Machinist. French; married. Has had full charge of all kinds of repairing. Understands all about boilers, engines, motors and can give best of references. 3090, Textile World Record.

Overseer or second hand's position. Understands twisting, warping, spooling and cone winding. Worked on all kinds of cotton yarns. Will not go West or South. 3112, Textile World Record.

Master Mechanic in cotton mill. Wants $1,500 to $2,500 per year, according to duties and position. Can take place at once. Will not go to Western States or Canada. Familiar with steam engines, pumps, boilers, water wheels and complete cotton mill equipment. 3039, Textile World Record.

The Correct Cone

From Photograph of Cone of Hosiery Yarn Wound by No. 50 Machine.



A soft package wound with less tension and less pressure than is possible with any other winding machine on the market.

The No. 50 Machine enables the winder to secure any degree of spacing or openness desired, and exactly the same spacing is maintained from core to surface.

Universal Winding Company

95 South Street, Boston

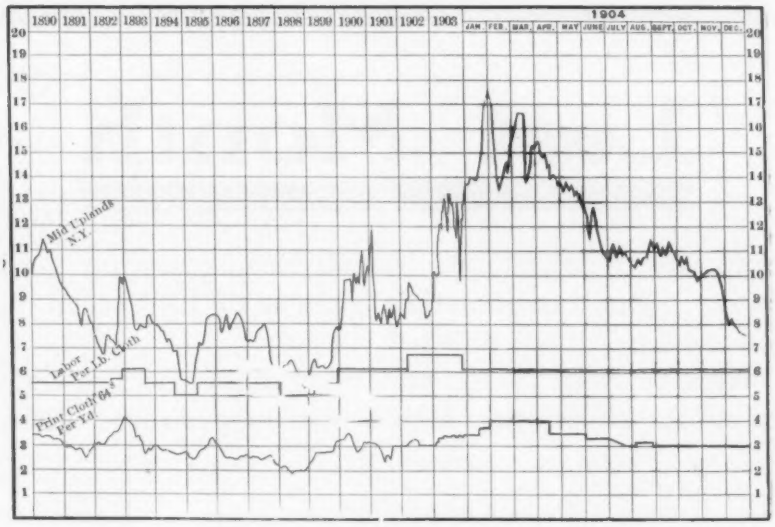

1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903
1904
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Mid Uplands N.Y.
Labor Per Lb. Cloth
Print Cloth 64 Per Yd.

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The Cotton Market.

The market has been in the control of the bears who in depressing prices have been favored by the general belief of a large yield from the present crop. No market incidents have antagonized this tendency and consequently spot cotton has made a low record of 6 3/4 cents for Middling Uplands. The movement into sight has been rather moderate for the past few weeks and not in proportion to the large yield that has been predicted. Following is the movement into sight from Sept. 1 to Dec. 23, as estimated by the Chronicle for a series of years:

1904	7,499,717	1901	6,338,349
1903	6,559,898	1900	6,458,494
1902	6,410,325	1899	5,792,025

A comparison has been made in the daily press between the total value of the present crop at current rates and the value of last year's crop, indicating that the planter will receive less for twelve million bales this year than for eleven million bales last year. This comparison is misleading because it ignores the fact that a large part of the present crop was sold at a high price before the recent decline. Thus in October the cotton exported amounted to 1,202,095 bales valued at an average price of over 10 cents per pound.

The present crop has been gathered without damage from unfavorable weather conditions, and the Government estimate of twelve million bales appears now to be conservative. The world's total visible supply is estimated by the Chronicle on December 24 at 4,611,550 bales, as compared with 3,968,533 bales on the same date in 1903, 3,756,315 bales in 1902 and 4,083,852 bales in 1901.

Wiscasset Mills Co. | Patterson Manfg. Co.
Efrid Manfg. Co. | Tuscorora Cotton Mill.

High Grade Hosiery Yarn

White and Colors. All Numbers.
Sewing Twine on Cones and Tubes.
SPECIALTIES IN WEAVING YARN.
Black and white. Double and twist for woolen trade.
CANNON MILLS. 55 Leonard Street, New York.

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice Pres. and Secy.
Established 1860—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

WEIMAR BROS. MANUFACTURERS OF Cotton Mercerized Tapes,
SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.
Phone Connections. Works, 2046-48 Amber Street. PHILADELPHIA, PA.

Last Month

We told you of Wyandotte Textile Soda receiving the highest award given any material because of its special fitness for scouring wool and finished cloth.

Now we want to submit additional evidence showing its claims for superiority do not rest upon awards alone.

(COPY)

Offices at
New York Chicago San Francisco Springfield
SPRINGFIELD KNITTING CO.
Infants', Misses', Ladies', Underwear
COTTON, MERINO, WOOL, SILK

SPRINGFIELD, Mass., Nov. 12, 1904,

The J. B. FORD Co., Wyandotte, Mich.

Gentlemen: — We have been using your Wyandotte Textile Soda for several years and are pleased to state that it has given us good results and has always been of excellent quality.

Yours very truly,
SPRINGFIELD KNITTING CO.
A. D. Smith, Manager.

None Genuine except with a card bearing this Trade Mark

In Every Package.

To Whom It May Concern:

We will donate $1000 to any established charity if on application we fail to furnish the original of the letter given above.

WHAT IT DOES FOR OTHERS IT WILL DO FOR YOU.

The J. B. FORD CO.

Sole Manufacturers

WYANDOTTE - MICH.

This Soda was awarded the highest prize — GOLD MEDAL — at the St. Louis Exposition

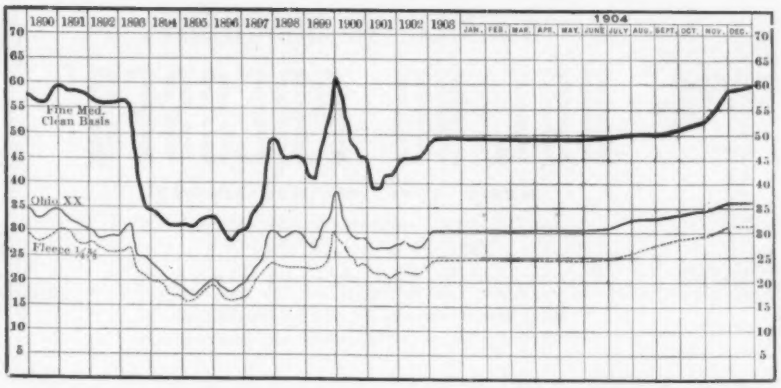


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

The Wool Market.

The volume of business in this market is of rather limited proportions, owing to the small stock in dealers' hands. The large buyers are out of the market, having supplied themselves early in the season, and inquiries now come from the smaller manufacturers who delayed purchasing too long, or from other manufacturers who find themselves under the necessity of piecing out on certain grades. The importation of wool is increasing both from Australia and South America, but the stock of the imported staple is not large enough to threaten the stability of the prices. Most of the shipments are on contracts to be delivered to the mills.

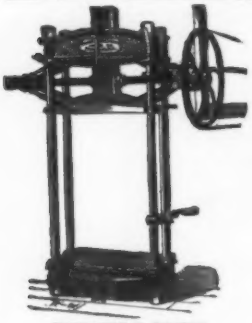
Prices on both domestic and foreign wools have been maintained. Manufacturers realize the existing conditions in the wool market which are likely to continue indefinitely and they are busy devising means of offsetting the increasing cost of the raw material. This will doubtless be done in many cases by remodeling fabrics and using wool substitutes. It is not likely that a further advance in the price of wool will occur as quotations are now at a level that is stimulating the use of cheaper materials. The general sentiment of the wool trade is against any further advance, as most dealers remember the comparatively recent experience with inflated prices. It is a sellers' market and dealers have no difficulty in exchanging their wool for cash at current rates.

Middleton Warnick, a member of the Greene Knitting Company, and a well known resident of Amsterdam, N. Y., died recently of heart trouble. He was stricken while sweeping snow in front of his residence.

TEXTILE MACHINERY
Large lot of Cotton, Woolen and Worsted Machinery of all kinds for sale. Best Prices paid for first-class second-hand machinery.
J. K. Lamb Textile Mach. Co.
246 Chestnut St.,
Long Distance Telephone. PHILADELPHIA, PA.

Wool and Woolen Goods Made NONSHRINKABLE
by the use of "Nevershrink Process."
May be applied at any stage of manufacturing. Write for Booklet.
CHARLES H. HEYER,
1501 Real Estate Trust Bldg. Philadelphia, Pa.
FORWOOL Nevershrink PROCESS.

STANDARD QUALITY COMBED RAMIE TOPS and NOILS a Specialty. RAMIE YARNS in All Numbers for All Purposes.
Wool, Mohair, Camel Hair, Silk, and Ramie Tops and Noils.
FRANK A. TIERNEY,
Wool, Tops, Noils, Yarns.
Woolen, Worsted, Mohair, Ramie and Silk Knitting Yarns.
All Kinds of Yarn for Weaving Purposes. Special Fibres and Novelties for Woolen, Cotton and Silk Manufacturers.
Room 203, Wool Exchange Building, 260 West Broadway, New York.



KNUCKLE JOINT.

BOOMER & BOSCHERT

BALING PRESSES

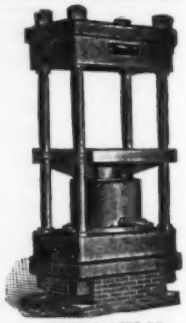
ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water S., SYRACUSE, N. Y.

Southern Agent, A. H. WASHBURN, Charlotte, N. C.



HYDRAULIC.

De Haven's All Steel Spinning Travelers.

FIG. 1.

FIG. 2.

Fig. 1 shows De Haven's all steel travelers. Fig. 2 shows case-hardened iron travelers. Which is best? We leave it to the common-sense of the spinner.

Insist upon getting **De Haven's High Carbon Steel Travelers** and you will produce better yarn and more of it for the same money.

De Haven Mfg. Co.,

50 Columbia Heights, BROOKLYN, N. Y.

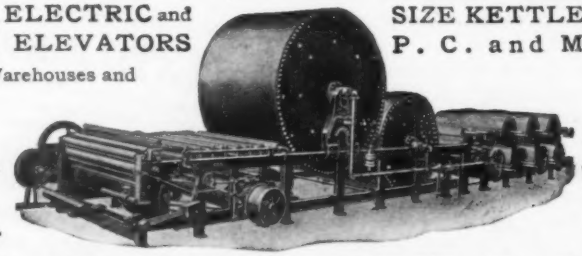
The COHOES SLASHER.

BELT-DRIVEN, ELECTRIC and HAND-POWER ELEVATORS

For Cotton Mills, Warehouses and Factories.

PULLEY BLOCKS.

OVERHEAD TRACKS.



SIZE KETTLES. REPAIRS for P. C. and M. MULES and EMPIRE LOOMS.

WATERWHEEL GOVERNORS.

The COHOES IRON FOUNDRY & MACHINE CO. Cohoes, N. Y.

LOOK!

THE BRANDEN RUBBER PUMP VALVE
Will Outlast Three Ordinary Valves.

Made for hot or cold water or any fluid where rubber valves are used. By its construction will outlast several ordinary valves. A trial will demonstrate the truth of our statements.

JOHNSTONE BLOW-OFF VALVE. A most durable and useful valve.

Pressure and Vacuum Gages. Pop Safety Valves.
Steam Engine Indicators. Whistles, Lubricators, Etc., Etc.

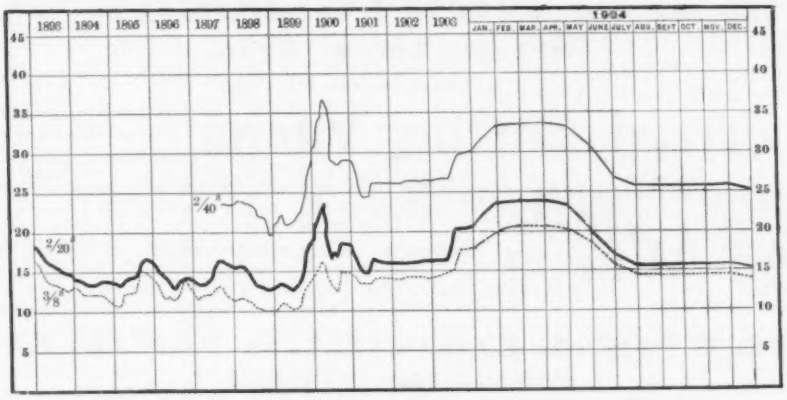
CROSBY STEAM APPLIANCES ARE UNEXCELLED.

CROSBY STEAM GAGE AND VALVE CO.,

Stores: Boston, New York, Chicago, London.

Office and Works: BOSTON, MASS,

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

The Cotton Yarn Market.

Business in cotton yarn has been influenced by the decline in the raw material which has brought about a corresponding decline in yarn. The most serious feature is the loss on existing contracts. In some instances buyers who placed orders for yarn based on ten cent cotton have endeavored to cancel these orders since the decline in the raw material. At this writing the sentiment in the yarn trade is more optimistic and the further decline which some anticipate may not occur. It will take some time to get business readjusted to the new price level. Business could be carried on in a much more satisfactory manner if the raw material was not subject to such sudden fluctuations, but this is a condition which has existed as long as the cotton market itself, and a satisfactory remedy has not yet been proposed. We quote as follows:

Eastern Cops.

6's	17
8's	17¼
10's	17¾
14's	18¼
16's	19¼
18's	19¾
20's	20¼
22's	20¾
24's	21¼
26's	21¾
30's	22¾
34's	23¾
36's	24¼
40's	25¼

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	19½
14's	20
18's	21
20's	22
24's	23
26's	24
30's	25
36's	26
40's	27
45's	31
50's	35
55's	39
60's	43

Eastern Two-Ply Warps, Carded Peeler.

2/30's	26
2/36's	27
2/40's	29
2/45's	31
2/50's	36
2/60's	44

Egyptian Weaving Yarns.

Single Skeins Combed.

30's	33
36's	35
40's	37
45's	39
50's	42
55's	45
60's	48
70's	57

Two and Three Ply Skeins, Combed.

30's	34
36's	38
40's	40
45's	42
50's	46
55's	49
60's	53
70's	63

Carpet Yarns.

60-yd. double reel filling	28
No. 2 60-yd. double reel filling	27½
1st quality ⅝	24
2d quality ⅝	23
60-yd. double reel filling skeins	10
(on cops)	11
120-yd. single reel cotton (on cops)	11
Wool ingrains, 42-yd. common	7
medium	8-8½
best	11½
extra best	15
light supers	18½
Super jute, 42 yard	7½
Super jute (light), 42 yard	7½-8
Velvet wool, spun, 135 yds., white	33
Gray	32

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

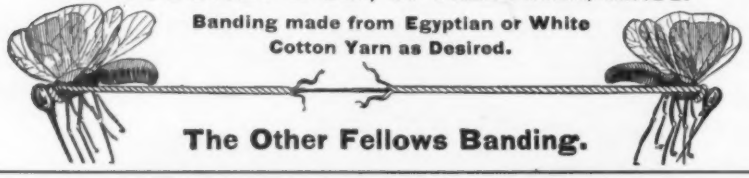
Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS.

4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

Philadelphia Yarn Market.

The cotton market was thoroughly demoralized by the Government reports and business was almost at a stand still immediately following. Things are beginning to readjust themselves on the new basis, but the slump in cotton had a bad effect on business, and it will take a long while for the textile business to recover. A great many manufacturers are having trouble delivering their goods and there are lots of unscrupulous buyers who are trying to get out of contracts placed before the drop. If manufacturers in the textile trade would unite in a concerted movement to prevent cancellations, it would relieve one of the worst elements in the textile business today.

Yarns have declined about 2c. per pound. Knitting yarns have probably been weaker than weaving yarns, as some numbers of the latter have been scarce. Probably there will be a good business done when things get readjusted.

Southern frame spun cones:—	
7's and Coarser	16
8's and 9's	16
10's	16
12's	16½
14's	17
16's	17½
18's	18
20's	18½
22's	19
24's	20
26's	20½
30's	21
40's	25
50's	30
Southern high grade mule yarn:—	
Cones.	
10's	18
12's	18½
14's	19
16's	19½
18's	20
20's and 22's	20½-21
24's	21½
Southern frame yarn, lower grades:—	
6's and 8's	15½
10's	16
Eastern cones (high grade quality):—	
10's	18½
12's	19
14's	19½
16's	20
18's	20½
20's and 22's	21-21½
Skein yarn (mostly Southern):—	
4's to 8's soft	16
10's to 12's	16½
14's to 20's	17½-18½
22's	19
14/2	17½
16/2	18
20/2	18½
30/2	21½
40/2	25-26
16/3 slack	17½
12/3 slack	17

PAULSON, LINKROUM & CO.
Successors to BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 Leonard St., NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Cotton Yarns
345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
206 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } **COTTON YARNS.**

E. D. LORIMER & CO.
COTTON YARNS } ALL NUMBERS
MERCERIZED YARNS } FOR ALL PURPOSES
346 BROADWAY, NEW YORK.

MOELLER & LITTAUER,
SILK, WORSTED, WOOLEN **YARNS** COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey-Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK

CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.

COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

Mills: Frankford, Pa.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

Walcott & Campbell Spinning Co.

Fancy Hosiery Yarns

IN ALL COLORS

New York Mills, Oneida Co., New York

A. G. THURSTON & SON,

MANUFACTURERS OF

Fluted Rolls, Pressers for Flyers

AND GENERAL MACHINERY

Specialties made of Renecking, Refluting, Filing and Honing of all kinds of Rolls. Flyers Repaired and Fitted with any desired style of Pressers, Spindles Straightened Restepped and Retopped.

Box 528. FALL RIVER, MASS.

Indian Orchard Company

Cotton Warps and Yarns. In Gray and all Colors, Single or two or more Ply, and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with wool, Machined or in Roving.

Indian Orchard, Mass.

E. MORGAN, PRES. H. K. WRIGHT, TREAS. W. C. GODFREY, AGT.

8/3 carpet	15½
8/3 slack	15½
9/4 slack	15½
Warps (mostly Southern)—	
10's to 12's	17
14's	17½
16's	18½
20's to 22's	19-19½
26's	21
14/2	18
16/2	18½
20/2	19
24/2	20
30/2	22
40/2	26½
Mixed colored yarns (mock twist, half colors):—	
6's to 10's	18-18½
12's to 14's	19-19½
16's to 18's	20-20½

Silver and jaeger, 1½c. over white.
Mock Egyptian, 2c. advance over white.
Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Spinners are getting but few new orders at the prevailing prices. Many orders were placed before the advance and in some instances yarn purchased at the low prices is not being delivered. One manufacturer placed orders last June for deliveries which were to begin November 1st, but the holder of the contract did not need the yarn in November and as the spinner did not press for spinning instructions the manufacturer made no specifications for his November delivery. At the end of November a letter was received from the spinner in which he stated that as the buyer of the yarn had not ordered forward his November delivery, he had concluded that the buyer did not want it and therefore had cancelled the amount of yarn which should have been delivered during the month of November.

Another spinner who "laid down" on the yarn purchaser did it in the good old popular way of making slow deliveries. Of course he did not refuse to deliver, but was very busy, and when the weaver wanted 2,000 pounds he was able to deliver only 200 pounds. Of course as the weaver was busy and needed the yarn he was forced to purchase his supply elsewhere or get his orders canceled. The spinner, of course, has lost a good customer, but such tactics are considered necessary to save loss on the part of certain spinners. As the season progresses many such cases will come up as the situation develops the fact that many of the spinners were long on orders and short on wool supply.

Spinners are very chary about accepting orders at any price, and the difference in the asking price for yarn varies according to the amount of wool owned by the spinner. We know one spinner with a small production who is forced to shut down his plant because he owns no wool and is unwilling to buy at the present high market value. He said that when quarter blood wool was selling at 24 cents per grease pound, he thought he had paid too high

TRY OUR
Silkine, also Lisle Silk
FINISH
—FOR—
Hosiery, Knit Goods, Yarn, Fast Black, Harsh Colors, and Fibres.
O. K. SOAP CO., 968 Franklin St., PHILA.

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns, For Weaving Purposes.
Linen Jacquard Harness Twines, Fine Cotton Harness and Heddle Twines, For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps, Cones, Cops, Tubes
COTTON YARNS
426 and 428 Market St., Phila.
Theo. H. Strouse & Co.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.
GASSED.·.YARN.·.SPECIALTIES

American Cotton Yarn Exchange
COMBED and CARDED
COTTON YARNS
From Northern and Southern Mills.
American, Egyptian, Peruvian and Sea Islands.
ARNOLD B. SANFORD, Pres. and Gen. Mgr.
PERCY H. de MAURIAC, Vice President.
OFFICES: 67 Chauncy St., Boston.
240 Chestnut St., Philadelphia.
108 Franklin St., N. Y. with James Talcott.

F. C. BARTON
MANUFACTURER OF LILY BRAND NARROW FABRICS
RIBBONS, TAPES, BINDINGS & NON ELASTIC WEBBINGS
54 FRANKLIN STREET, NEW YORK

ALLEGHENY WORSTED MILLS,

Thomas Wolstenho'me Sons & Co.,
MANFRS. OF
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.

Worsted
YARNS
Sell Direct,
Office and Mills, Frankford Ave. and Westmoreland St., Phila, Pa.

Pocasset Worsted Company,

WORSTED YARNS
IN THE GRAY.

Mills at
Thornton, R. I.

Office
100 Boylston St., Boston, Mass.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. B. F. BOYER CO., Bradford System.
MANUFACTURERS OF
WORSTED AND WOOLEN YARNS,
Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

Woolen and Merino
YARNS
Eaton Rapids Woolen Mills,
EATON RAPIDS, MICH.

EDDY & STREET,
Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

RICHARD CAMPION,
SELLING AGENT FOR
Bristol Worsted Mills,
Highland Worsted Mills,
Loridan Worsted Co.,
17 Bank St., PHILADELPHIA, PA.

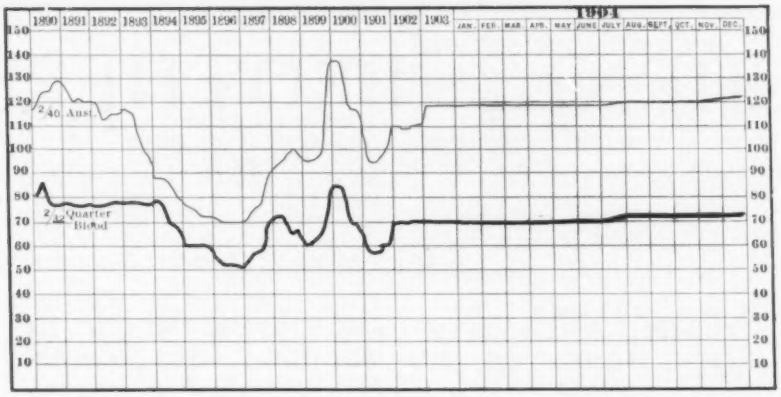


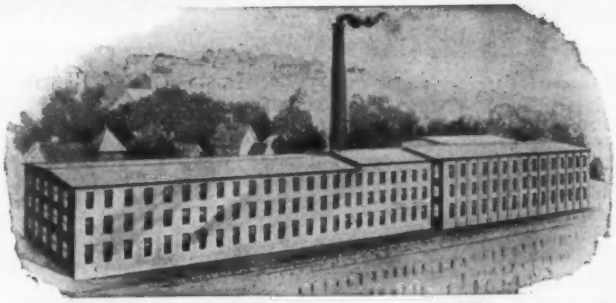
CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

a price and sold some of his holdings as he expected wool to reach a lower level, but instead of that being the case wool of this grade advanced to 33 cents per pound, and he is unwilling to buy at this valuation. He is going to close down his mill and wait until next season before purchasing more wool, and at the present time is trying to run his machinery on commission work.

One large weaver wanted to place an order last week for some yarn at a price which was 4 cents per pound under the asking price. He said he must get this price in order to get any business; if he could not buy at his price he would not accept the order for the cloth and therefore would not need the yarn. He wrote to several yarn manufacturers and one of them accepted the order at the desired price. Another spinner who had reduced his price within 2 cents of the price wanted and then lost the order, said he could not have made the price quoted had it not been for the fact that he owned some wool purchased before the advance. There are certain kinds of yarn that spinners will not quote on at any price. In reply to inquiry they say that they do not care to quote as they have no wool from which to make the yarn and therefore do not want the business.

Some weavers have not bought and state that they have a limited amount of yarn, enough to make a certain number of pieces of cloth. When their supply is exhausted they propose to quote prices for cloth based on the market price of yarn. If their customers will pay the advance which, in some instances means 25 to 35 cents per yard advance, they will make the cloth, otherwise they will close down their plants and wait for another season, or make some imitation of cloth on the market from cotton yarn or woolen spun yarn. They claim this is the only safe course to follow on the present uncertain market. They realize that certain large mills own yarn and wool at com-

SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.
MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.
MOHAIR TOPS AND YARNS FOR WEAVING
LUSTRE YARNS FOR SERGE LININGS
ALPACA YARNS

SPINNERS OF MOHAIR YARNS FOR ZIBELINES
DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS
MOHAIR

CHENEY BROTHERS,

Silk Manufacturers,

SOUTH MANCHESTER, CONNECTICUT.

TRAMS, ORGANZINE AND SPUN SILKS IN THE HANK, OR ON SPOOLS AND CONES.

SILKS FOR ELECTRICAL USES, INSULATION AND SPECIAL PURPOSES MADE TO ORDER.

KNITTING SILKS, RIBBONS AND PIECE GOODS FOR TRIMMING KNIT GOODS.

Pure Dye and Fast Colors Warranted.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

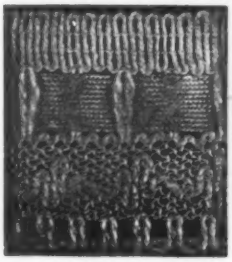
SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 210 Monroe St.—Boston Office, 78 Chauncy St.



GEORGE W. CHAPIN,

BRAIDS Cotton, Worsted, Mercerized, Cotton and Silk Twilled. **TAPES** Common, Twilled, Superfine and Plain 13 to 35s, white and colors on spools.

YARNS Cops, Skeins, Warps, Tubes and Cones. **THREADS** on Spools, Tubes, Cones, Unbleached, Bleached and Colors for Manufacturers' use.

CROCHET LACE EDGINGS Latest Styles in Pant Laces.

229 Church Street 231 . . PHILADELPHIA

paratively low prices and to meet this competition on the present basis of wool and yarn values is entirely out of the question. From this it looks as if the larger mills would get the business next season and the smaller mills would be forced to shut down. Just how this state of affairs is going to benefit the wool merchant who owns the wool and is trying to secure an advance is a question. If these smaller mills cannot secure orders because of the high prices and the larger mills do not want to buy yarn because of previous purchases, what are the spinners going to do? What is the wool merchant going to do? If the small mills are to run, the spinner will be forced to meet the market or he in turn will be forced to close down his mill.

The outlook for the coming heavy weight season for men's wear is pointing to a larger use of mercerized worsteds, cotton worsteds, and fancy worsteds, made of cotton double and twist yarns and shoddy wool goods. Some of the large weavers are planning to use 3 1/4 run warp wool yarn in place of worsted, and are meeting the market prices by many substitutes. Dress goods are in good demand, but the styles are swinging from the coarser grades to a finer quality. Panama cloth is in great demand at present. This is very like voile, only closer set, and is selling from 50 to 75 cents per yard. The yarn used is 2/36s and 1/18s for filling. The yarn most used for filling is a 1/18s French spun about a 1/4 to 3/8 quality. This makes a soft, pliable fabric and those who wish to make a success in its production must use French spun yarn in the filling. We know of one mill which is making this fabric in piece dyes only, which has refused to take further orders as the mill is hopelessly oversold.

Top makers are well employed and their production is well sold up. The outlook is one of uncertainty and only the future will determine the outcome. We quote:

2/40's Australian	1.20
2/40's XX Delaine	1.10
2/40's Half Blood	1.05
2/20's Half Blood	.85
2/36's ⅜ Blood	.75
2/26's ¼ Blood	.68

Woolen Yarn.

Spinners are well employed and the prospective season bids fair to be a good one. Those who are working on commission have as many orders as they can well handle, the call being from the overcoating, French flannel, and eiderdown branches of the industry. There are also many inquiries from the men's wear, rubber boot and underwear manufacturers. The yarn sold has mostly been sample lots for future delivery, as not much business will be done in this direction until after the first of the year.

Some of the weavers who generally have their yarn spun on commission are trying this year to buy it outright at a given price, hoping by some means to get their prices to fit requirements.

JENCKES SPINNING CO.,
Formerly E. JENCKES MFG. CO.
Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
PAWTUCKET, R. I.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40's and above. AND
FITCHBURG, MASS. WARPS

FLOSSETTE MILLS
of the
New England Thread Co.
CENTRAL FALLS, - - R. I.
(DYERS and BLEACHERS) and MANUFACTURERS of
High Class Threads on Tubes, Spools and Cones and MERCERIZED YARNS for Knitting.
GLAZING OF YARNS
For the Shoe Lace. TAPE and WEBBING TRADE.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

Knitting and Weaving
YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
226 CHESTNUT STREET,
Philadelphia, Pa.

No Secret

About the success of white NON-FLUID OILS for lubricating TWISTER RINGS! They simply reduce stains on yarn to a minimum; keep rings and rails clean; perceptibly lengthen life of travelers; show a material saving over stainless oils or tallow mixtures. Are used by a majority of the yarn and thread mills. Free sample by paid express.

NEW YORK & NEW JERSEY LUBRICANT CO.
17 Church St., New York City.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Phila.

Woolen and Merino Yarns,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
E. M. ROCKWELL, - - LEOMINSTER, MASS.

E. G. HARPER,
WORSTED and WOOLEN YARNS,
MERCERIZED COTTON,
395 BROADWAY, TEL. 1020 FRANKLIN NEW YORK.

YARNS Solis, Boston.
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SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

HOFFMAN, DeWITT & McDONOUGH,
Diamond Stay Bindings TRADE MARK
Manufacturers of
Tapes, Webbing and Bindings.
COTTMAN and G STS., PHILADELPHIA
Ryer's Station, P. & R. R. R.
Bell Telephone, 203 Cheltenham.

TELEPHONE SYSTEMS Especially adapted for MILL USE.
Write for Catalogues.
The North Electric Company,
178 St. Clair St., CLEVELAND, O.

There are several large contracts pending and the trend of the trade is toward the use of this yarn in warp as well as filling. Much 3-run and 3 1/4-run yarn will be used by the weavers and some of these yarns are to be made to match worsted yarn as far as possible. Many buyers state that although business will be late in coming forward, they expect to be open to place some large orders after January 15. Much yarn will be required in 2 ply by the knitters of golf jackets, sweaters and caps, who have hitherto been using worsted yarn, but which has advanced beyond their ability to buy and sell their production.

Underwear knitters throughout New York State expect a good business during the next six months, but there will be a large amount of cotton used in order to produce underwear at the prices required. Some knitters cannot use cotton and thus will be unable to produce attractive samples at the established basis of value, and the qualities which they can produce are so inferior that they are unwilling to show the samples. One knitter struck the key note when he said that last year on account of the high price of cotton he refused to sell any merino underwear; this year he says he will sell merino garments, but on account of the high wool values will sell no wool goods. He said he did not propose to fight with the department stores for the establishment of a new basis of value, and would only sell the grade of garments that he could make and reach the required range of prices.

All the importers have been doing a good business in thread waste of fine quality and will continue to do so, as domestic threads have advanced in price until Australian threads are much the cheapest. Australian thread waste is selling from 63 to 65 cents per pound, while there is absolutely no domestic thread on the market. Some good orders for Australian lambs' wool have been secured from 77½ to 80 cents per pound carbonized, and from 75 to 76 cents for free scoured wool. The price of fine domestic wool is so high that these prices seem cheap and indications point to a large use of this Australian lambs' wool the coming season.

Prices advanced 20 per cent. the first of the season because of the large American purchases, and those importers who bought early will have some high priced wool to sell, whereas those who waited are able to make lower prices for better wool. Those who bought at the high notch will want 80 to 85 cents for carbonized lambs.

Black wool is very scarce and the going price is 72 to 75 cents. Black tops which are equally scarce are selling for 87½ to 90 cents per pound. Silk waste is largely used for mixing purposes and with good success. The spinners of woolen yarn have a good season ahead of them and later will see a great shortage of wool spinning space.

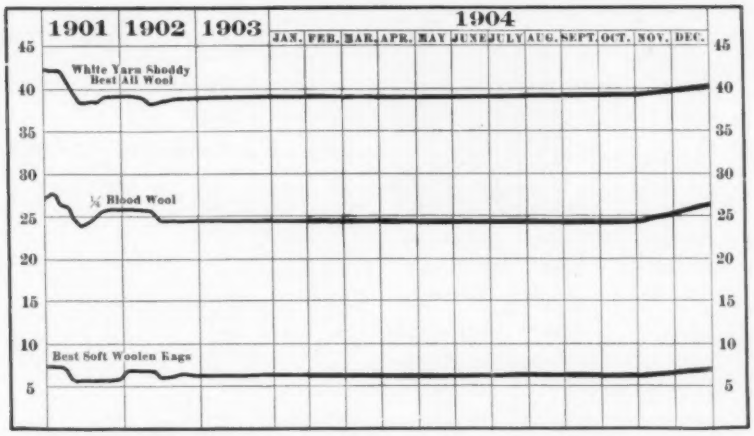

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

Rag and Shoddy Market.

Strengthening of prices and increased activity of business have occurred in this market during the past month. These conditions have been brought about by the advance in wool and the approach of the heavy weight season which has necessitated the purchase of large quantities of raw material by spinners. There has been considerable trading between dealers, much of it speculative, and on all sides one hears predictions of higher prices and a good business. The advance has been resisted by manufacturers who have restricted their purchases to actual requirements. Shoddy manufacturers have advanced their prices, but, it is claimed, not in proportion to the advance in prices of rags.

Spinners have been forced to substitute shoddy for wool in getting out new yarns and fabrics, owing to the high prices for new wool. The strong statistical position in the wool market affords a good foundation for the belief that the high price for wool will continue and, consequently, that spinners will continue to use large quantities of wool substitutes. Wool waste has been in good demand and the supply is small. Desirable lots are quickly taken up. The decline in the price of cotton has produced a market for cotton waste, but at market rates hard waste finds a ready sale, owing to the general activity in manufacturing industries throughout the country. We quote as follows:

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25

Merino.

Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	20-21
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17

WOOLEN RAGS.

Regular gray	12-13
Black	14-15
Fancy colors	16-20
Fine merchant tailors, all colors	9-11
Choice light colors	13-15
Browns	12-13
Blacks	9½-10½
Fine blues, plain	9-11
Fine dark	10-11
Medium dark	7-8

Worsteds.

Blue	16-18
Black	18-20

Serges.

New black	15-16
New blue	14-15

Flannels.

New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	7-7½
Old white flannels	14-16
White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20

Garnetted Hosiery Waste

In Cotton, Cotton and Wool Mixes, and All Wool. White and Light Colors a Specialty.

SEND FOR MONTHLY PRICE LIST.

FRANK B. GRAVES, Cor. Church and Arch Sts., ALBANY, N. Y.

WOOL WASTE FOR SALE.

No. 41,390. About 20,000 pounds. Greyish brown mix. Fine medium quality, good staple.
No. 41,391. About 10,000 pounds. Straight black. Medium coarse, fair staple.
No. 41,392. About 8,000 pounds. Coarse dark brown mix. Short staple.
No. 30,163. About 60,000 pounds. Medium quality, good staple, dark brown mix.
No. 30,234. About 175 bags. Black. This is medium quality, good staple.

All the above lots are quite clean and dry, except the last number, which consists of about 70% of scoured wool card waste, and about 30% of unscoured. It also contains a small percentage of fast black cotton.
No. 30,163 shows about 25% of cotton. All other lots are supposed to be all wool. Samples sent on application.

Address Dept. 7.
CHAS. W. BECKER, Agent, AMSTERDAM, N. Y.

WILLIAM B. CHARLES,

Cotton and Cotton Wastes

Amsterdam, N. Y., U. S. A.

COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

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Springfield, Vt.

Carbonized Stock a Specialty. **FLOCKS**

M. B. SCHWAB, Pres. H. HAWITSER, Treas.
ED. GLUECK, Sec. and Gen. Mgr.

RIVERDALE WOOLEN CO., MANUFACTURERS OF

.. Shoddies ..

Of every description. Capacity 7,000,000 pounds per annum. Custom Carbonizing and Garnetting a Specialty.

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You Save Enough Insurance to Pay for the Equipment.

So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.

Pettes & Randall Co., 150 Nassau St., New York

Old plaids	5-7
White stockings	17-18
White hood stock	20-21
Clear hoods	9-10
Red stockings	9-10
Blue stockings	7-8
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14

Merinos.

Light, fine	13½-15
Light, coarse	7½-8
Fine, dark	12-13
Dark, No. 2	8-9
Coarse dark	5-6
Blue	12-13
Blue-seamed	13-14
Black—unseamed	12-13
New black	18-20
Small	3¼-4
Bunting	6-8

FLOCKS.

Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1, black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3¼

NOILS.

Australian	48-50
Fine domestic	38-40
½ Blood	24-28
⅜ Blood	22-23
¼ Blood	17-19
Braid	21-22
Carpet (white)	14-18
Carpet (colored)	10-12½

Seedy.

½ Blood	35-37
⅜ Blood	27-30
¼ Blood	23-26

COTTON WASTE.

No. 1 Spinners	7-7½
No. 1 Machine	6-6½

SOUTHERN and WESTERN MILLS!

Why not have your yarn dyed in the West saving time and freight? Prompt attention guaranteed.

PHŒNIX STEAM DYE HOUSE,
12-18 Southport Ave., - . CHICAGO
Cotton Yarns a Specialty.

No. 2 Machine	4½-5¼
Machine Cop	6½-7
No. 1 Cop	6½-7
No. 1 Card	6½-7
No. 2 Card	6-6½
No. 1 Oily Card	4-4½
No. 2 Oily Card	3-3½
Peeler Combing	7-7½
Egyptian Combing	Limited Quantity
No. 1 Linters	4-4½
No. 2 Linters	3½-4
White Clips	5½-6
Colored Clips	4-5
No. 1 Picker	2-3

Dyestuffs and Chemicals.

Acids.

Acetic 100 lbs.	2.25-3.70
Citric, domestic	31-32½
Oxalic	5-5½
Sulphuric, 60 deg. 100 lbs.	1.10-1.30
Muriatic, 18 deg.	1.50-1.60
Tartaric crystals	30½-30¾

Miscellaneous Chemicals.

Acetate of lime, gray 100 lbs.	2.00-2.05
Alum, lump	1.75-1.80
ground	1.85-1.95
powdered	3.00-3.25
Aqua ammonia 16 deg.	3¾-4
Ammoniac, sal. gray	5⅞-6⅛
Borax, bbls.	7½-8
Brimstone, crude, foreign ton	21.00-21.50
Copperas	52½-65
Cream tartar, crystals	24½-24¾
Fuller's earth, lump, 100 lbs.	80-85
powdered	80-85
Glauber's salt	50-60
Potash, chlorate, crystals	8¼-8¾
powdered	8⅜-9
carbonate	3.6-5
Soda ash, carbonate, 48 per cent.	1.25-1.50
high test	1.00-1.25
Soda, bicarbonate, English	3.50-6.00
American	1.30-1.70
Soda, caustic, domestic 60 per cent.	1.87½-1.95
Sal. English	67½-70
Sal. American	60-70
Sulphate, alumina	¾-1¼
Vitriol, blue	5⅛-5¼

Dyestuffs.

Acetate of soda	3½-3¾
Acid, picric, best crystals	25-30
tannic, commercial	33-40
Albumen, egg	48-65
blood	20-25
Alizarine, red	15½-16
Aniline oil	9¾-10
salt crystals	8¾-9
Antimony salt, 65 per cent	10¼-11
Bichloride of tin, 50 per cent	9¼-9¾
60 per cent.	12½-12¾
Bichromate of potash, American	8½-8¾
Bichromate of soda	6½-6¾
Bisulphate of soda	1½-2
Cutch, mat	4½-6

In Textile Mills

Warren's Pulley Cover

is the best and most economical belt slipping preventative. It is used by many of the best mills in the United States.

Any careful man can apply it.

Sufficient for 40 sq. ft., $5; 125 sq. ft., $12. If your supply house does not sell it, order direct.

The Warren Co., Mfrs., 25 E. Chicago Ave., Chicago, Ill.

boxes	6-8
Dextrine, imported	6¾-7
corn	2½-3
Divi-divi ton	35.00-40.00
Flavine	23-40
Fustic, stick, ton	18.00-22.00
young root	31.00-35.00
Gambier	4⅞-5
Hypo. of soda, Am. bbls. cwt.	1.50-1.60
Indigo, Bengal, low grade	60-67½
medium	70-80
high grade	95-1.00
Kurpah's, medium to good	55-60
Kurpah's, higher grade	65-75
Gautemala	55-75
Manila	48-55
Madras	46-50
J. (Synthetic)	18-20
Indigotine	95-1.80
Logwood, stick, ton	16.00-23.00
roots	16.00-18.00
Madder, Dutch	7-10
Muriate of tin, 36 degrees	9-9¼
52 degrees	15-15¼
Nitrate of iron, commercial	1¼-1½
Nutgalls, blue Aleppo	17-18
Persian berries	6-7
Phosphate of soda	2¼-3
Prussiate of potash, yellow	13¾-14
Quercitron, ton	18-20
Starch, corn, pearl, bbls.	2.17
corn, pearl, bags	2.02
potato	3¾-4
rice	5-6½
wheat	5¼-6
Stannate of soda	12-20
Sumac, Sicily, No. 1, ton	42.00-44.00
Sicily, No. 2, ton	40.00-42.00
Virginia	37.00-38.00
Tapioca flour	2-2¼
Tin crystals	22-23½
Turmeric, Bengal	3-3¼
Zinc dust	5¼-5½

Extracts.

Fustic, solid	8-11
liquid, 51 degrees	5½-8
Indigo	6-10
Logwood, solid	6-12
liquid, 51 degrees	5-10
Persian berry	9-15
Sumac	3-6

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Manufacturers of

MERCERIZED YARNS

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MERCERIZERS AND DYERS.

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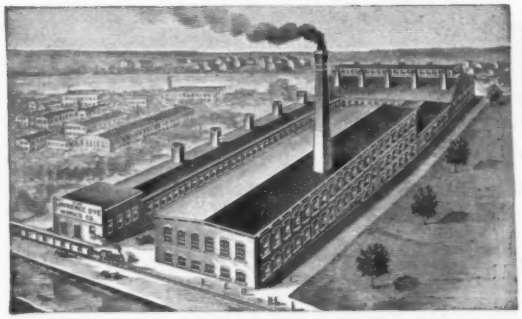
THE LAWRENCE DYE WORKS COMPANY

LAWRENCE, MASS.



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DYERS, BLEACHERS AND **MERCERIZERS**

OF COTTON WARPS AND SKEIN YARNS.

Globe Bleach and Dye Works,
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We are Dyers of all kinds of YARNS Cotton AND Warps

We are sure we can give you better work and better service that you can get elsewhere. A trial will convince.

T. BROPHY'S SONS, Jasper St., above Clearfield St., - PHILADELPHIA, PA.

WE DO BLEACHING and DYEING

ESPECIALLY FOR THE **KNIT GOODS TRADE**

YARNS BLEACHED AND DYED (delivered on cones)
CONE WINDING FOR THE TRADE.

Schuylkill Haven Bleach and Dye Works, SAMUEL ROWLAND, **Schuylkill Haven, Pa.**

N. B. Bleached Finishing Yarns on Cones for Underwear, always in Stock.

INCRAHAMVILLE DYE WORKS,

Dyers and Bleachers of Cotton Yarns in long or Short Chain Warps and Skein, in FAST COLORS, FOR BLEACHING PURPOSES, Cross Dyeing, Ginghams, Etc.

Also Dyers of Turkey Reds and Indigo Blues for all purposes in either Warp or Skein.

Telephone. PAWTUCKET, R. I.

FIRTH & FOSTER CO.,

Dyers and Finishers of Dress Goods, Men's Wear and Cloakings, such as Venetians, Armures, Soleils, Crepons, also Silk Warp Fabrics, Cotton Warp Linings, Suitings, Clays, Serges, Worsted Damasks, Tapestries and Shirtings.

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Does the Best Bleaching at the Most Reasonable Rates?

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Drying and Sulphur House Poles of Natural Round Water Grown Cedar for Cotton, Wool, etc. Special Hardwoods in Standard No. 1 and "Selects" without knots, grades, for Silk Dyeing. Manufactured by, prices and all information from

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Fast Black Dye Works

HOSIERY DYEING A SPECIALTY.

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Cleans Wool, Floors, Anything.

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MILL SOAPS

OF EVERY DESCRIPTION. ALSO LAUNDRY SOAPS. ALL GOODS GUARANTEED.

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HOME BLEACH and DYE WORKS, Inc.,

DYERS AND BLEACHERS OF COTTON YARNS

Fast Colors for the Woolen Trade. Capacity 20,000 lbs. per day.

Office and Works, Pawtucket, R. I.

Pawtucket Dyeing and Bleaching Co.

Bleachers and Dyers of COTTON YARNS and STOCKINET

Office with Blodgett & Orswell Co., Manufacturers of Glazed Yarns.

232 Front St., Pawtucket, R. I.

Established 1848. Telephone Connection.

JAMES J. TULLY,

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Fulling and Scouring Soaps

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THIOGENE OIL

Superior to Turkey Red Oil in the dyeing of Sulphur Colors.

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without bronzing or streaking and leaves the stock in perfect condition for carding or weaving.

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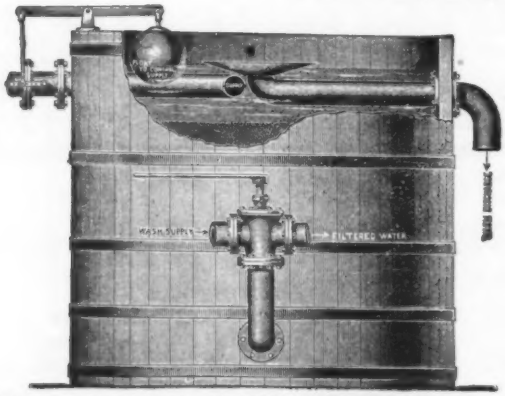

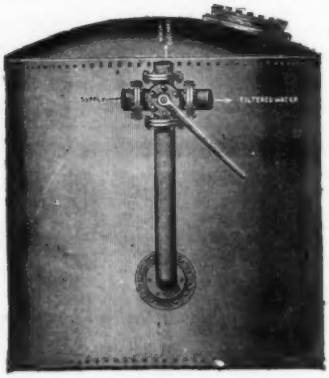

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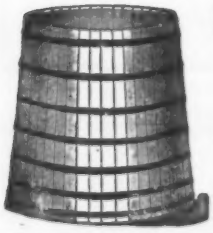

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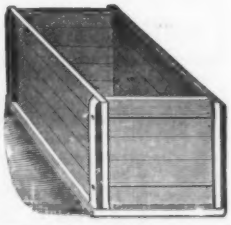

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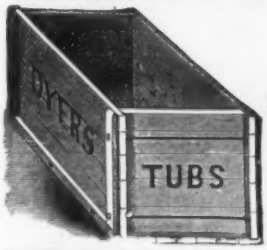

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Tubs and Tanks of all kinds for Dyers, Bleachers, Factories, etc.
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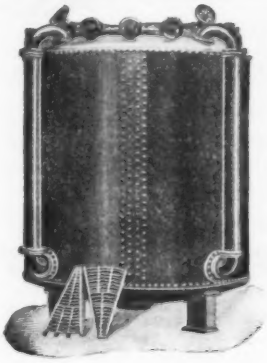

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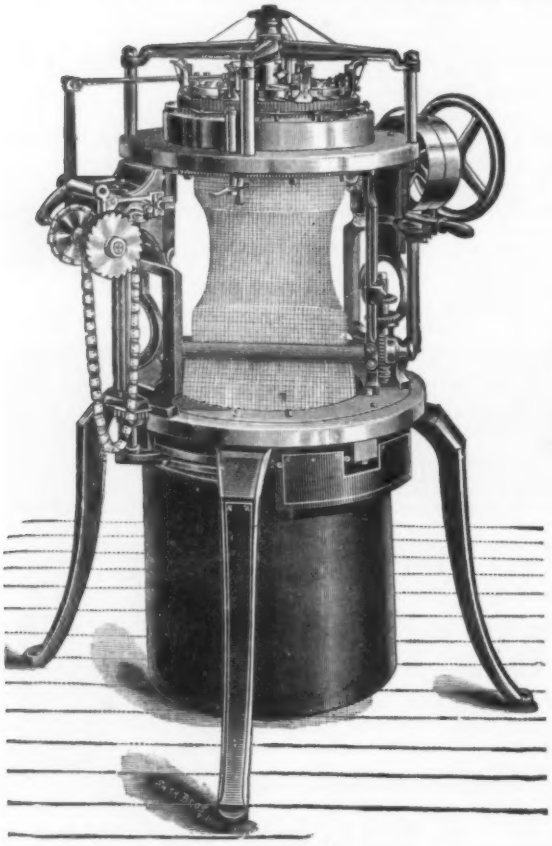
AUTOMATIC AND PLAIN

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



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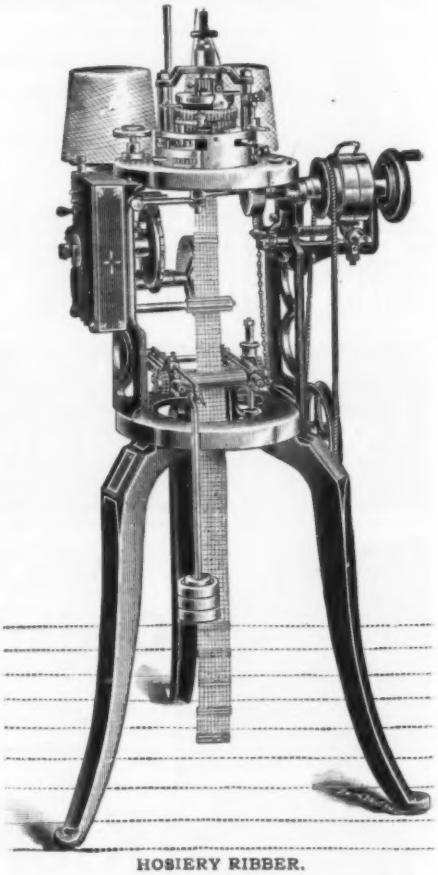

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ESTABLISHED REPUTATION FOR LARGEST PRODUCTION, BEST QUALITY FABRIC, DURABILITY, ECONOMY OF OPERATION

Full Particulars, Description and Samples Furnished upon Application to the

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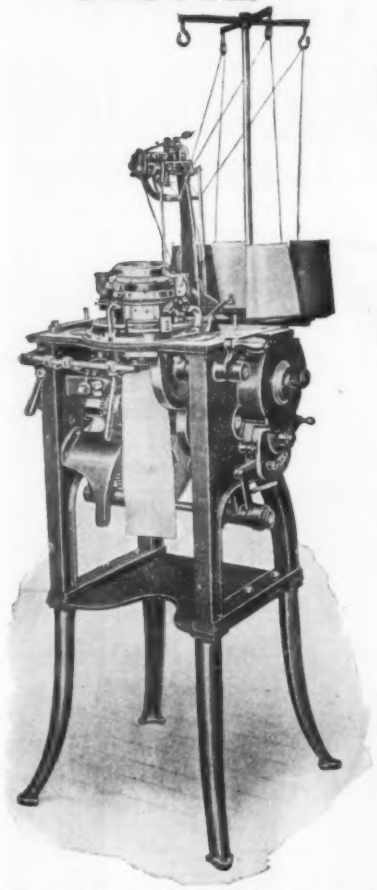

The Two Leaders

Fully Automatic Hosiery Knitters

For Making all Kinds and Gauges of Seamless Hosiery

HEMPHILL

One with

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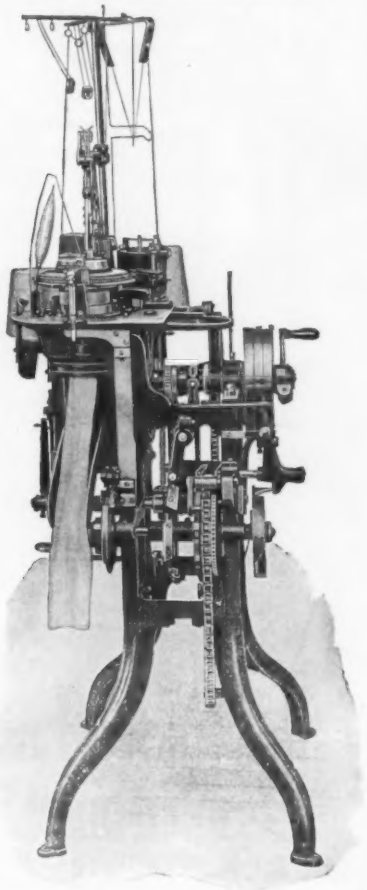
for pattern mechanism



To meet the various tastes of different manufacturers. Both used and approved by leading hosiery manufacturers.

Both contain all the well-known essentials demanded of first-class knitting machines.

With these two machines we can supply all the manufacturer's possible wants in the best possible manner.

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Many leading manufacturers use our needles and say they are the best on the market.

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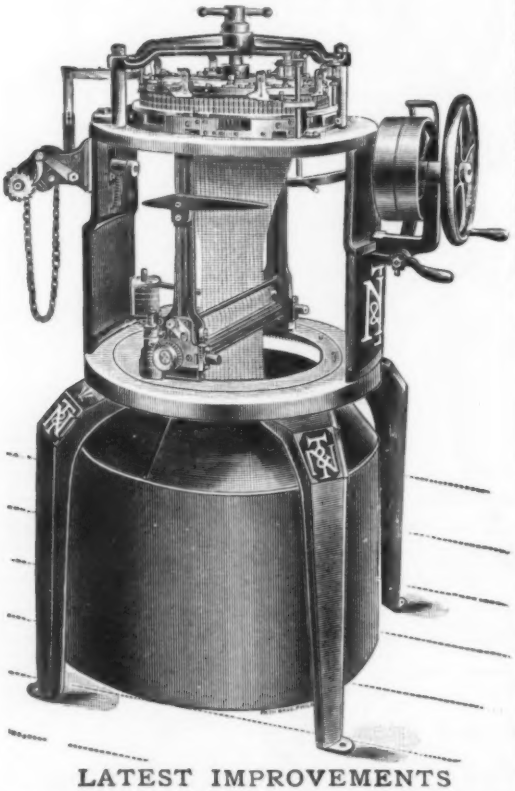
Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

Correct Construction. Excellence and Durability.



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QUALITY OF FABRICS AND PRODUCTION

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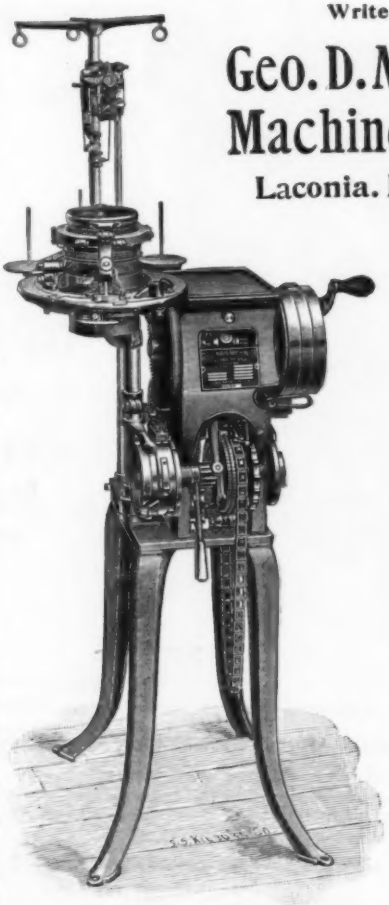

Latest, Simplest, Best.

MAYO'S

New Full Automatic Knitter.

The Old Reliable

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EDGINGS AND BRAIDS.

Unequalled Facilities for Prompt Deliveries of Any Quantity.

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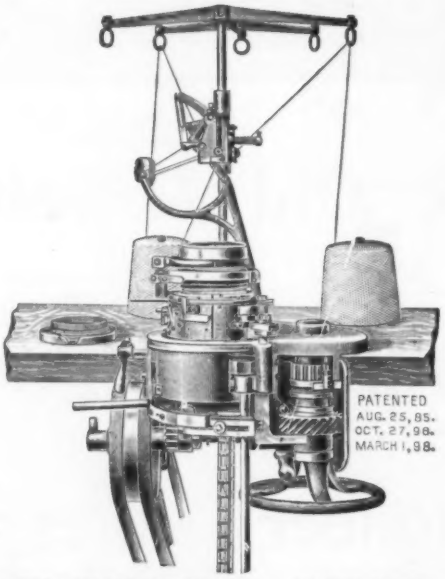
The "INVINCIBLE"

The "INVINCIBLE" is reasonable in price.

It's best advertisement—the recommendation of its users.

Its METHOD of TRANSFERRING is still the best.

Others try to imitate.



Full Automatic Knitting Machine

"The Knitter That Knits."

Leads Them All.

Write for Catalogue.

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High Speed Overseaming, Overedging and Scallop Stitch Machines

are LIGHT RUNNING, FAST and DURABLE.

OUR NEW STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

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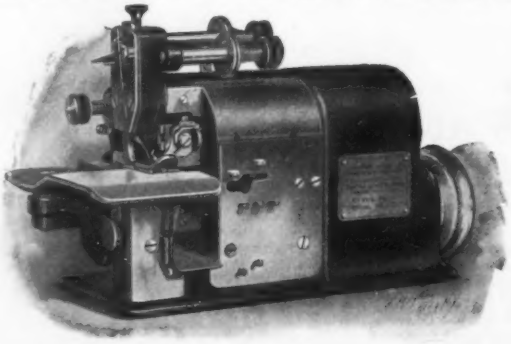
For Necks and Fronts of Rib Goods, produces the most showy, substantial finish.



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SUCCESSORS TO

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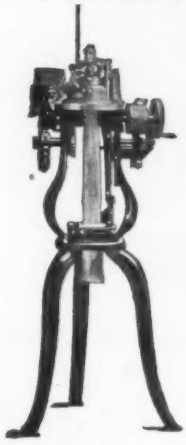


Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

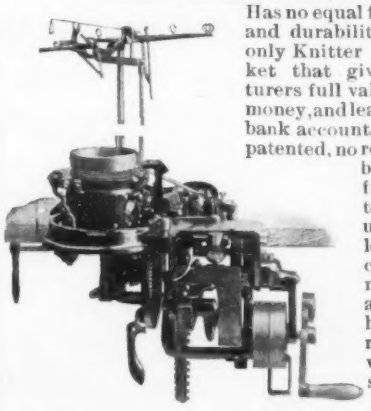
ALL KINDS OF

CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. Correspondence Solicited.

The New Improved

Boss 15/16 Automatic KNITTER



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THE BOSS KNITTING MACHINE WORKS,

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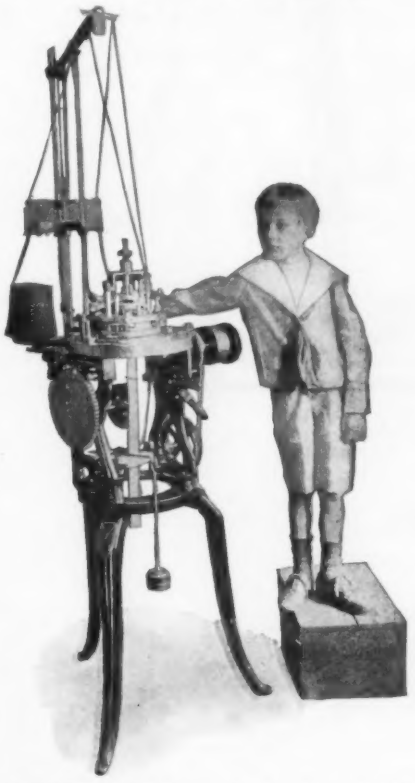
HARDENED STEEL CYLINDERS A SPECIALTY.

A FAIR PROPOSITION

If wanting to purchase Ribbers, you can try a

RUTH RIBBER and STOP MOTION

before buying to satisfy yourself that they are all right. Our STOP MOTION is a decided improvement over all others. No cutting of yarn, easy to thread. Stops from any imperfection in yarn. The movement of one lever releases brake and corrects yarn guide, when stop is caused by knot you have but one hook to thread. Very positive in its action.



Our RIBBER is high speed, durable, simple and easy to operate, with largest production; single or double feed, plain or fancy stitch for half hose and misses goods. Large loose-course, good round welt, double knee, sleeves or cuffs. Knits wool or cotton yarn, fine or course guage. Hardened cylinders and dials for any make of machine. Best Workmanship. All products guaranteed. Can attach STOP MOTION to any style machine.

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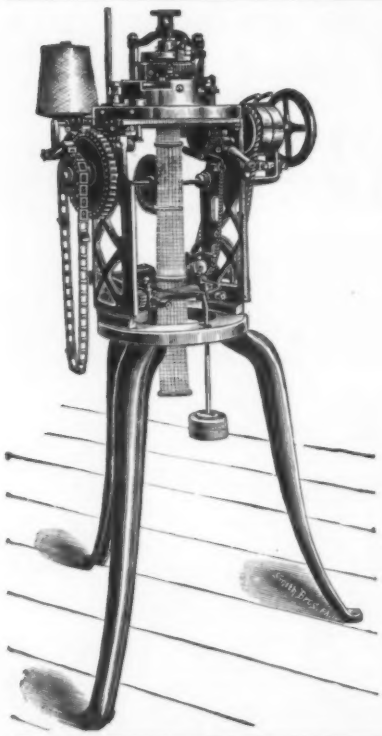
Address Box "N." G. W. Ruth, Manager.



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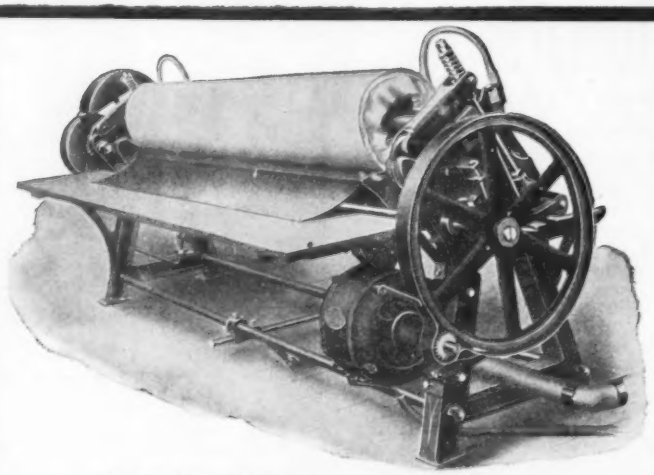
BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.



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Every Year

THE LOSS THROUGH POWER WASTED BY BELTS AND SHAFTING in the UNITED STATES EXCEEDS THE LOSS BY FIRE.

You insure against fire why not insure against wasted power by using Direct Connected Electric Motors.

WATSON TEXTILE MOTORS

Are Especially Designed to Fit the Needs of Textile Plants.

If you wish your clothes to fit you buy them "made to order" not "already made."
Why not have your motors "made to order" and have them fit the work.

Send for Bulletins.

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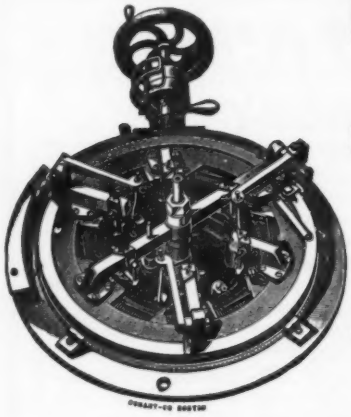

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Either plain or full automatic, with stop motions complete, for

Ribbed Underwear, Sweaters, Cardigans, Cuffs and Anklets.

The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

Also Builders of ABEL WINDERS, SEAMERS and LOOPERS.

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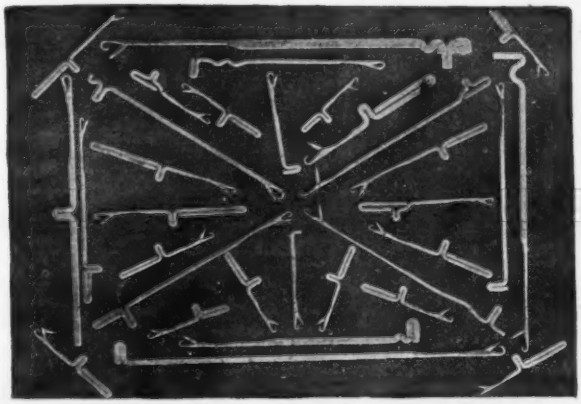
For all Knitting Machines.



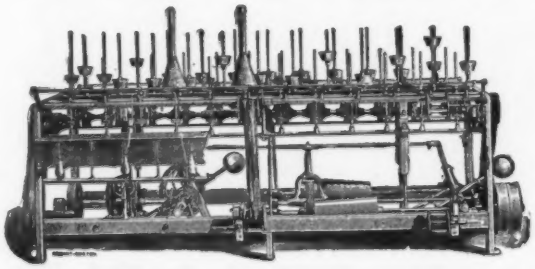
Our Superior or Sunken Rivet Head Needles

Will save you money every day in the year.

Dodge Needle Co., Manchester, N.H.

We now build, with or without differential motion, for winding on Bobbins from Skein or Cop,

THE ABEL WINDERS



ALSO THE

Abel Seamers and Loopers

IN CONNECTION WITH OUR LINE OF

AUTOMATIC RIB KNITTING MACHINERY.

LEIGHTON MACHINE CO., Manchester, N. H.

JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

OF ALL KINDS. NEW AND SECOND HAND.

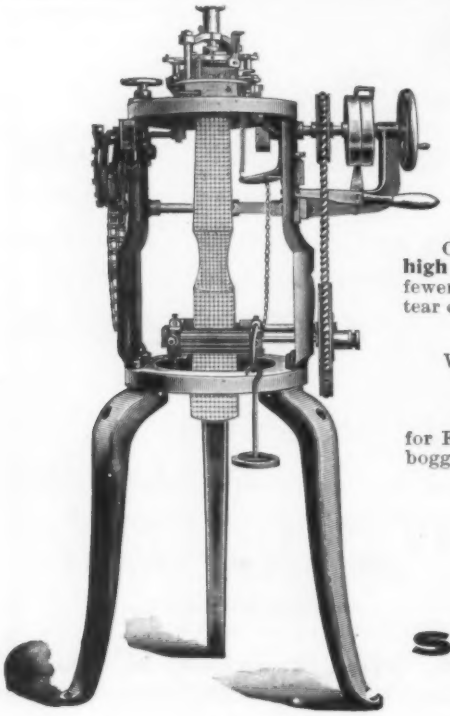
A RARE OPPORTUNITY TO BUY.

1 complete plant; 500 per day of ladies', gents' and misses' hose. Modern mchy.
28 Beattie & Hepworth & Abel loopers.
4 Corneley embroidery machines.
10 Hosiery presses (lever).
1 14 plate Crawford press.
11 Lamb and Grosser sweater machines.
150 Ribbed underwear machines, various sizes and makes. 1 Sensitive drill.
60 Brinton & Co. ¾ aut. knitters, sizes.
27 Standard A machines.
56 Union Special machines, various styles
1 Rotary fire pump.
1 5 h. p. electric motor.
100 Mayo machines. Various sizes.
100 Brooks welters.
4 Fleecing machines.
98 Brinton & Co. and other make hosiery ribbers.
36 Invincible machines, 176 needles, almost new
1 Wayburn fabric cutter.
40 Ribbed shirt machine cylinders and dials, all sizes, cuts and makes.
1 Smith & Drum singeing machines.
250 Doz. Cyclone underwear dryer.
1 Sandusky mangle, 60-inch
1 36-inch engine driven extractor
1 9 plate Crawford press, 32 x 50.
2 40 Sp. Payne cop winders.
2 Lindsay & Hyde winders.
3 No. 50 Merrow machines. C. & G.
1 Grosser Jacquard machine.
2 Cyclone hosiery dryers 2 Typewriters.
5 Band folding and cutting machines.
1 48 spindle Payne Cop winder.
1 Hemphill Rib-cutter.
4 30-inch ventilating fans.

WRITE FOR COMPLETE LIST.

APPRAISEMENTS A SPECIALTY.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at **very high speed,** giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

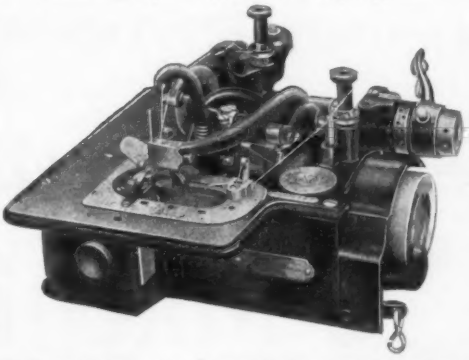
LITTLE FALLS, N. Y.

"OVERLOCK" Machine

TRADE MARK. (Pat. April 5, 1892.)

Patent twice upheld by U. S. Court of Appeals.

For Trimming, Seaming (or Hemming or Overedging) and Covering Raw Edges of Knit Underwear and Hosiery in **ONE OPERATION,** and for making "Overlock" Corded Edge on Lace Curtains, Silks, Ribbons Etc.



Extract from Report of U. S. Consul at Nottingham, Eng.

"The Overlock stitching device of Willcox & Gibbs has had a phenomenal success since the date of its introduction * * * * The keen competition among manufacturers has necessitated its use, both as a matter of economy and to improve the character of output for a discriminating market."

TRADE MARK.

Business Est. 1859.

WILLCOX & GIBBS SEWING MACHINE COMPANY

General Offices, 658 Broadway, cor Bond Street,

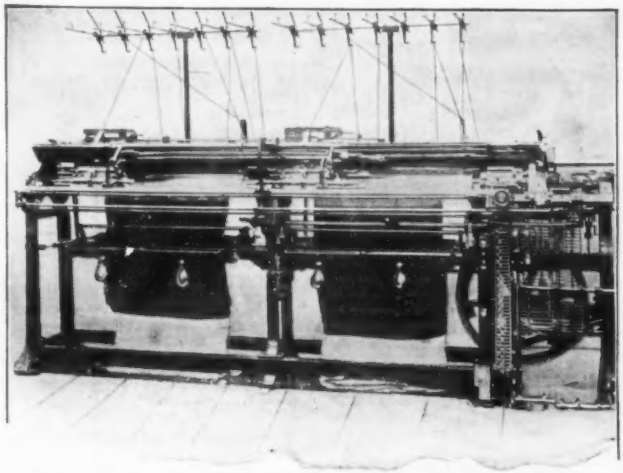
NEW YORK, N. Y.

Branches: LONDON PARIS MILAN DRESDEN

The Grosser Knitting Machine Co.

MAX NYDEGGER,

Wool Exchange Building, Room 400, **260 W. Broadway, NEW YORK.**



Full Automatic, Power, Jacquard Noppen Machine, "GROSSER." Dependent and Independent Heads. Latest Improvements.

Are You Interested in Power Machines?

Why don't you write for the new **"Grosser" Catalogue,** giving you any desirable information about **Full Automatic Flat Knitting Machines?**

Swatches and Samples of the latest Novelties in the Knit Goods line at your disposal.

Large Stock in Hand Power Machines, Needles, Parts and Supplies.

Prompt attention.

Best Construction; Selected Materials; Rapid Delivery.

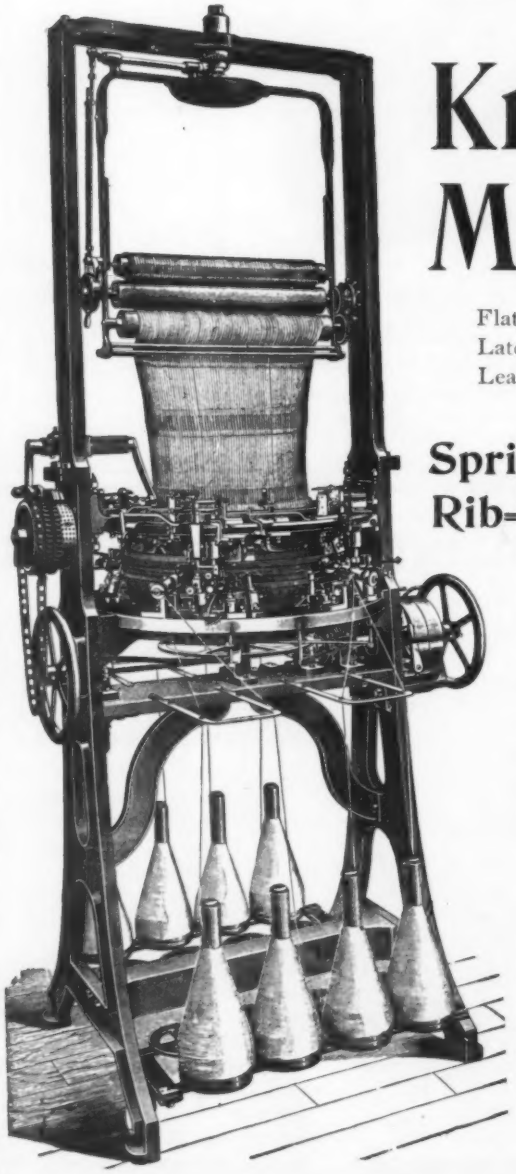
Power Machines to be seen **in Operation.**

Agency and show rooms, Phila., Frank Reichenbach, 728 N. 4th St.

Charles Cooper

BENNINGTON, VERMONT

MANUFACTURER OF



Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder.

Spring Needle Cylinder Rib-Top Machines

For making Cuffs, Drawer Bottoms and Shirt Borders.

Spring and Latch Knitting Needles,
Burr Wheels, Burr Blades,
Sinkers, Jacks, etc.

Collarette Attachment

European Representatives,
MOSES MELLOR & SONS, Ltd.,
Nottingham, England.

C. J. Sibbald, General Representative,
757 River St., Troy, N. Y.

PAXTON & O'NEILL'S

3-4 AUTOMATIC KNITTER

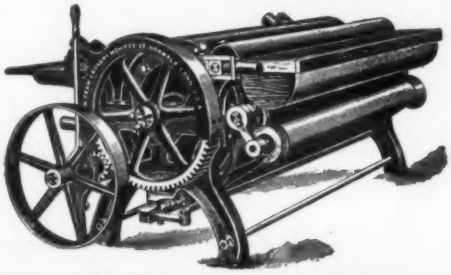
FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers. Range on Half Hose, from the coarsest to 260 needle.

Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

Cylinders and Dials for all size Machines. **127 Bread Street, Phila.**

AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

J. W. CRAW LAUNDRY MACHINERY CO.,

SOUTH NORWALK, CONN.

HEPWORTH & CO.'S

Patent Single-Stitch

LOOPING MACHINE.

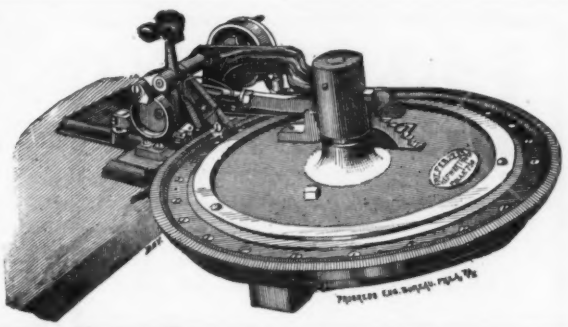
Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

JOHN W. HEPWORTH & CO.,

N. W. Cor. Lehigh Ave. and Mascher Street,

PHILADELPHIA.



Drying Forms.

BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

JOS. T. PEARSON 1815-21 TAYLOR ST. KENSINGTON PHILA.

Hosiery Boards.

EXCELSIOR KNITTING MACHINE MFG. CO.

BUILDERS OF

Full Automatic Knitters

WITH OR WITHOUT

Transferring Device

ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

MEADOW AND WASHINGTON STREETS ALLENTOWN, PA.

$ 50,000.00 Subscribed

SITE DONATED

and the citizens of one of the best communities on our llne are making determined efforts to locate a cotton mill and knitting mill.

They want to get in touch with a brainy, experienced operator, who can subscribe some stock and assume active management of the plant.

The immediate section produces cotton of the finest staple; the farmers themselves have subscribed stock and are interested in the success of the venture.

Cheap fuel, intelligent white labor, low rates on the finished product, are some of the attractive features.

For additional information address

J. W. WHITE,

General Industrial Agent, Portsmouth, Va.

SEABOARD AIR LINE RAILWAY

If you want to move your plant South write us.

Standard of Excellence

STEPHENSON BEST BAR BEST BELT DRESSING

PRESERVES BELTS — PREVENTS SLIPPING

Sole by progressive dealers or by

STEPHENSON MFG. CO.

ALBANY, N. Y.

G. Bickelhaupt Skylight Works

Sole Manufacturers of

G. B. TRADE MARK SPECIALTIES.

SELF-LOCKING SCUTTLE OPENER.

Skylight Lift and Skylights.

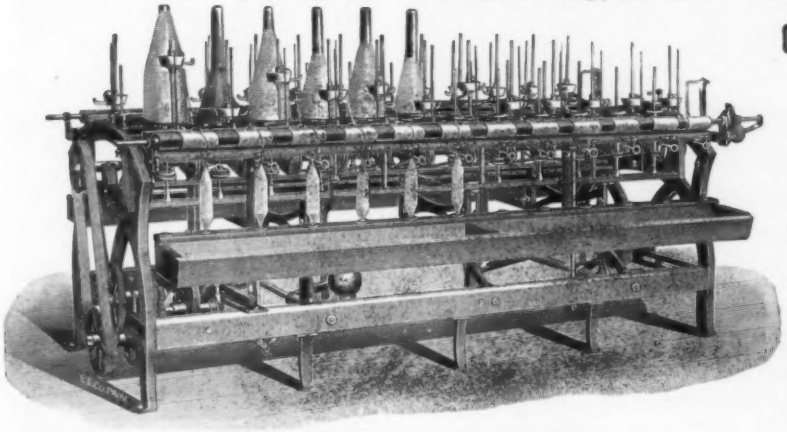
Established 1869. Send for pamphlets.

243-245 N. 47th Street, - NEW YORK.

GEO. W. PAYNE, Prest. J. MILTON PAYNE, Treas. CLINTON F. PAYNE, Sec'y.

OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



GEO. W. PAYNE CO.,

[Est. 1865. Inc. 1903.]

Builders of the

Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quill from Cop, Skein or Bobbin.

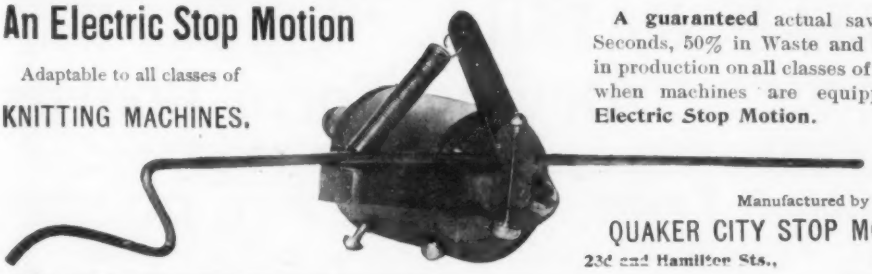
Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

OFFICE, 102 BROAD STREET
Pawtucket, R. I.

An Electric Stop Motion

Adaptable to all classes of

KNITTING MACHINES.



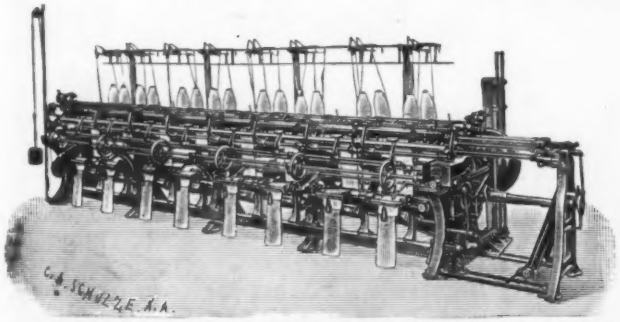
A guaranteed actual saving of 90% in Seconds, 50% in Waste and a 30% increase in production on all classes of Knitted Goods, when machines are equipped with **this Electric Stop Motion.**

Manufactured by

QUAKER CITY STOP MOTION CO.,

23d and Hamilton Sts., Philadelphia, Pa.

SEYFERT & DONNER, CHEMNITZ, GERMANY.



BUILDERS OF ALL KINDS OF

Flat Knitting Machines

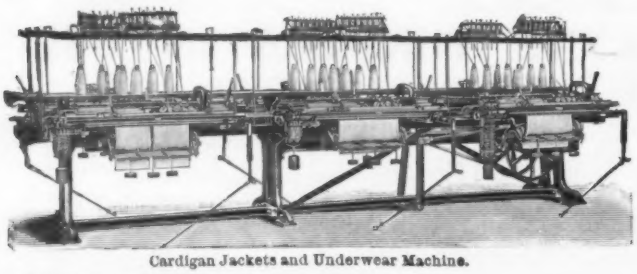
(LATCH NEEDLES)

This cut shows the **AUTOMATIC NARROWING MACHINE,** eight at once, for the manufacture of plain, seamless legs of Ladies' hose in endless bands with dividing thread. These legs, footed on the Circular machine, give the most perfect and cheapest full fashioned seamless hose that ever existed on the market.

N.B.—Narrowing Machines are built in various types for the manufacture of all kinds of underwear, garments, etc

FULL AUTOMATIC POWER KNITTING MACHINES—Independent Heads. Patentees and sole makers of the **"TEUTONIA,"** best and quickest hand-knitting machine for hose and half hose. Griswold heel, narrowed toe.

Sole Agent for the United States, JULIUS MULLER, 132 Melrose Street, Brooklyn, N.Y.



Cardigan Jackets and Underwear Machine.

AUTOMATIC

Knitting Machines

For Plain and Fancy Goods.

THE BEST IN THE MARKET!

Special Constructions for different articles!

INDEPENDENT HEADS.

DOUBLE SYSTEM OF LOCKS.

Double-side Power Stands, 6 at once.

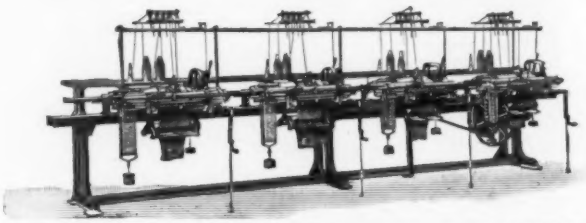
Paris, 1900, Gold Medal.

Ask for samples and particulars, state guage and size you want.

CLAES & FLENTJE,

Mülhausen, Thür, Germany.

Representatives: Ainslie Knitting Machine Co., Ainslie & Humboldt Sts., Brooklyn, N. Y., where all kinds of hand and power machines can be seen working.



Automatic Widening Machine for Sleeves, Drawers, Garments, Plain and Ribbed.

WILLIAM C. BULL,

BENNINGTON, VERMONT.

For Ladies', Gents', and Children's Goods.

LATEST STYLES.

BEST WORKMANSHIP.

MAKER OF

Drying Form Boards

OF EVERY VARIETY.

Stanton & Lewis

CENTRAL STEAM FORGE

316 and 318 Florist St.,

PHILADELPHIA .. .. PENN.

The best equipped shop in the United States for the Manufacture of

Knitting Machine Cylinder

and Sinker Bed Ring Forgings, from the smallest to 30 in. dia. of the best steel.

KNIT FABRICS CUT TO LENGTH.

Our Knit Fabric Cutter

will cut from the roll, knit fabric into any length from 10″ to 40″ at the rate of 100 pieces a minute. The lengths are accurate, the waste is a minimum, the labor unskilled.

We also make a Slitter

for cutting these goods into narrow strips and re-winding same into rolls.

SAMUEL M. LANGSTON,

Manufacturer of Paper Box Machinery.

812 Winter Street, Philadelphia, Pa.

CRANE MFG. CO. Lakeport, N. H.

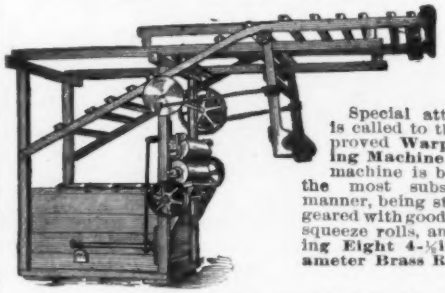
Spring Needle Circular

KNITTING MACHINE.

For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.

A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets.

The Reliance Warp Dyeing Machine.



Special attention is called to this improved **Warp Dyeing Machine.** This machine is built in the most substantial manner, being strongly geared with good, heavy squeeze rolls, and having **Eight 4-¼in. Diameter Brass Rolls.**

This machine, with our Improved Plater-down has met with marvelous success, and parties desiring machinery of this class, can make no mistake on ours For further particulars and prices, address

CHARLES HART,

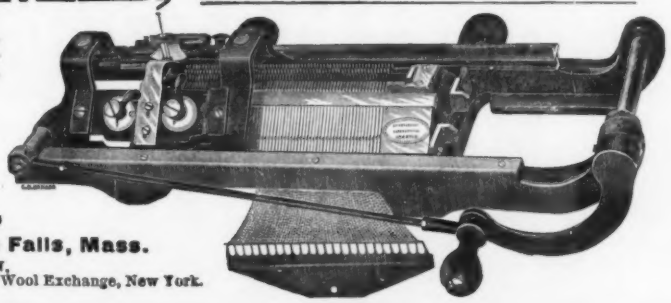
Hedge and Brown Streets, ***FRANKFORD, PHILA.***

The LAMB, LEADER OF KNITTERS,

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

CIRCULAR MACHINES,
RIB TOP and
SEAMING MACHINES.



LAMB KNITTING MACHINE COMPANY,

P. O. Box 5888, Chicopee Falls, Mass.

S. E. WOODHEAD, 100 22d St., Chicago.

L. D. SANBORN, Room 305 Wool Exchange, New York.

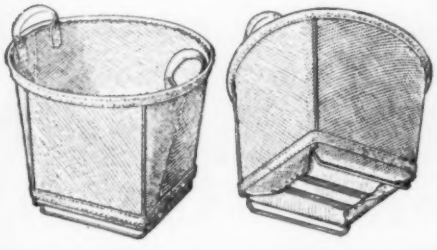
PAT'D MORRIS TRADE MARK BASKET TARDVILLE R.I.

Morris

SPRING BOTTOM
DUCK MILL BASKETS

ARE MADE ROUND,
SQUARE or OBLONG

Thousands of them are used in the mills of this country. Let us send you a sample on approval.

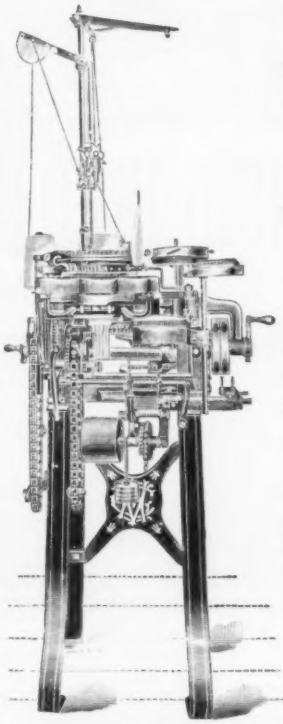


Morris & Co., Dept. T Groveville, N. J.

We Know How

TO BUILD HOSIERY MACHINERY

That's Why There Are More Standards



in use than any other make.

Have you seen the new Standard F?

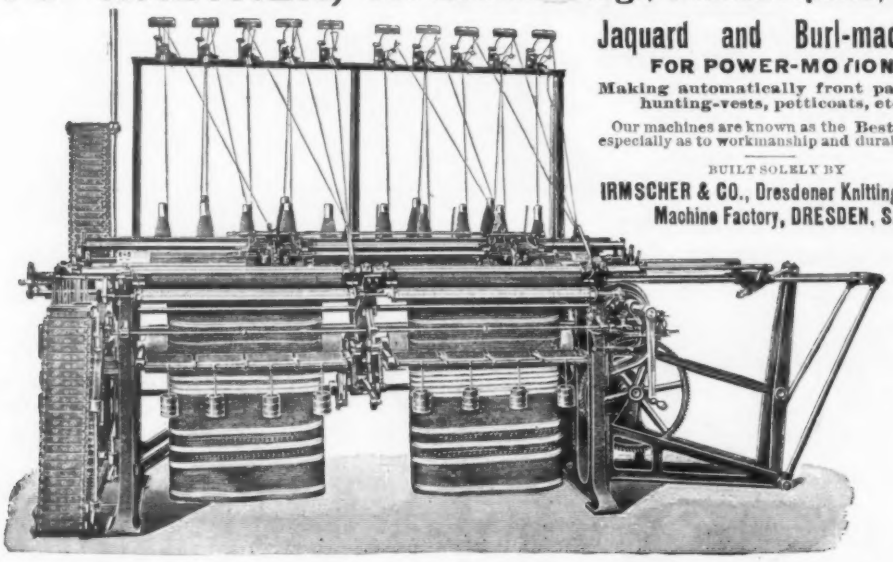
It will produce from **30%** to **50%** more goods than any other machine on the market.

Hosiery manufacturers are invited to inspect it in our show rooms.

ARE YOU INTERESTED?

STANDARD MACHINE CO.,
508 Ludlow Street,
Philadelphia.

OTTO WALTHER, 591 Bourse Bldg., Philadelphia, Pa.



Jaquard and Burl-machine
FOR POWER-MOTION
Making automatically front parts of hunting-vests, petticoats, etc.

Our machines are known as the Best Built especially as to workmanship and durability.

BUILT SOLELY BY
IRMSCHER & CO., Dresdener Knitting Machine Factory, DRESDEN, SAXONY

SWEATERS.—This machine is built with 1 or two sections which work together (dependently of each-other) and produces all patterns which could be made hitherto on Hand-Jaquard- and Burl-machines automatically in endless pieces with dividing thread. We are ready to wait on with collection of same which will be the best recommendation, and here we will mention but to following advantage of this machine which is constructed very genlously: It is provided with autom. racking-apparatus as far as 6 needles, special cams for double rib, autom. change of all middle and wing-cams, 2 thread-carriers, autom. change of colors, special attachment for locking in the loops and electric stop-motion in case of yarn-breaking, knots, etc.

All these apparatus are set to work by the pattern-chain, consisting of a number of Jaquard-cards. This new arrangement which is our invention enables the knitter to put together any pattern, making the necessary cards by means of a stamp and after a table we subjoin.

Special Hand and Power Machinery for Fancy Gloves, Sweaters, Golf Hose, Ladies' Blouses, Etc.

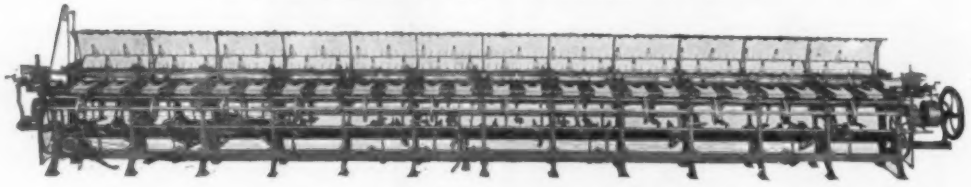
FULL-FASHIONED HOSIERY MACHINERY

.. BUILT BY ..

Chemnitzer Wirkwaaren-Maschinenfabrik

(Formerly SCHUBERT & SALZER)

CHEMNITZ, GERMANY.



HALF-HOSE LEGGER OF 24 SECTIONS.

All classes of flat work machines for full-fashioned hosiery in all gauges, from 21, 24, 27 up to 51 guage, from 12-24 sections, also machines for full-fashioned shirts and pants in all guages from 6-10 sections, with narrowing and widening.

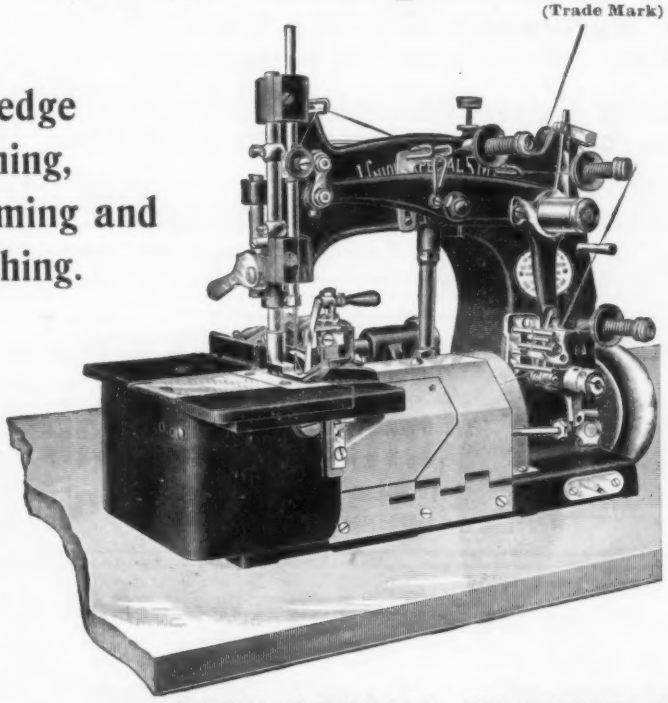
Representative: OTTO WALTHER, 591 Bourse, PHILADELPHIA

High Speed and Most Durable Mechanism are the Essential Elements of Machines to Produce Sewed Articles. We have these Elements in the

New Union Special Single "Interlock" Machine

(Trade Mark)

For Overedge Seaming, Hemming and Finishing.



High Speed Class 15400.

Two or Three Thread Stitch.

Simplicity.

Durability.

UNION SPECIAL MACHINE CO.

75 E. Kinzie Street, Chicago.
731 Arch Street, Philadelphia.
9 Andrews Street, Rochester, N. Y.
96 South Street, Boston.
1230 Olive Street, St. Louis.
47 Leonard Street, New York.
Amsterdam, N. Y.
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714 Main Street, Cincinnati.
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A. McMICHAEL,

Machinist,

Repairs to Hosiery and Underwear Machines, Cylinders and Dials of every description.

FINE MACHINE WORK.

22 Armat Street, near Main, Germantown,

PHILADELPHIA, PA

We HARDEN all CYLINDERS and DIALS large and small.

Hegeman Seamless Bobbin Cover.

The best, cheapest and most satisfactory covering for winder bobbins. Will fit on any style or size.

FRANK E. KOLB,
MILL SUPPLIES
Amsterdam, N. Y.
SOLE AGENT FOR
Adams' Patented Latch Needles

SMALL RIB MACHINES
CROCHET MACHINES

NATIONAL

SHELL STITCH
MACHINES

Spring Beard Needle Machine
For SEAMLESS HOSIERY, Plain and Novelties

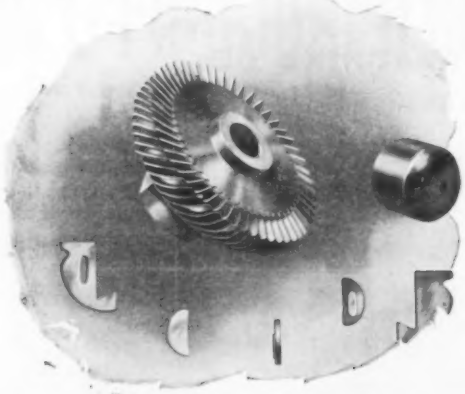
Automatic Rib Machine
For RIBBED UNDERWEAR. All Styles and Gauges

Over Seam Machine "Champion Improved"
For Welting Seamless Hosiery. Covering Raw Edges of Rib Fabrics.

NATIONAL AUTOMATIC KNITTER CO.
SEND FOR FULL PARTICULARS
724-726-728 Cherry St., Philadelphia

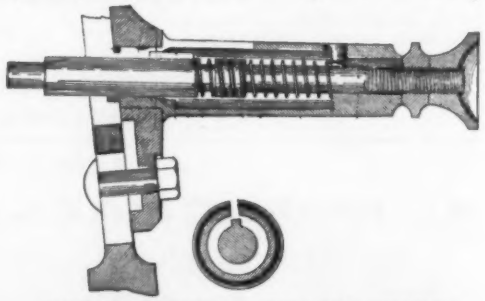
WOLFGANG RICHTER,
Importer and Builder of
Full Fashioned Knitting Machinery
N. E. Corner Third and Green Streets,
PHILADELPHIA, PA.

TOMPKINS LATEST IMPROVED **Backing Burr**



Tompkins Bros. Co., Troy, N. Y.
Circular Spring Needle Knitting Machinery.

ROBERT W. CORMLY & CO.
TROY, N. Y.
—BUILDERS OF—
Spring Needle Knitting Machinery



PATENT BURR STAND TUBE
The cheapest and best on the market with more and simpler adjustment than any other make.

WILFRED WELLS,
Sole Manufacturer of the
CHAMPION HOSIERY STAMP.
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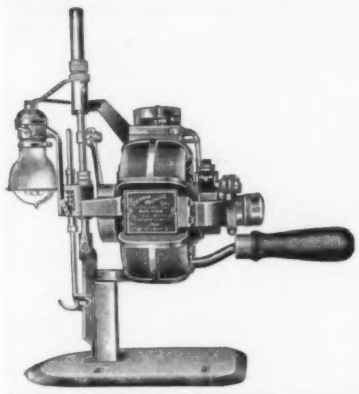

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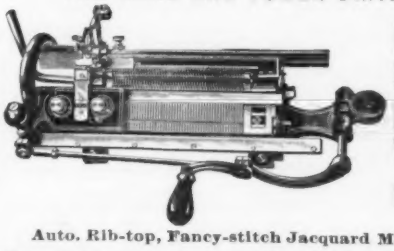

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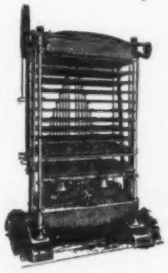

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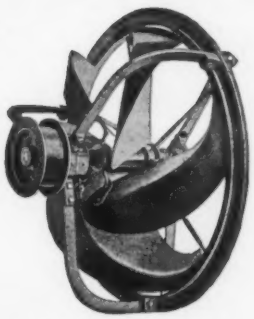

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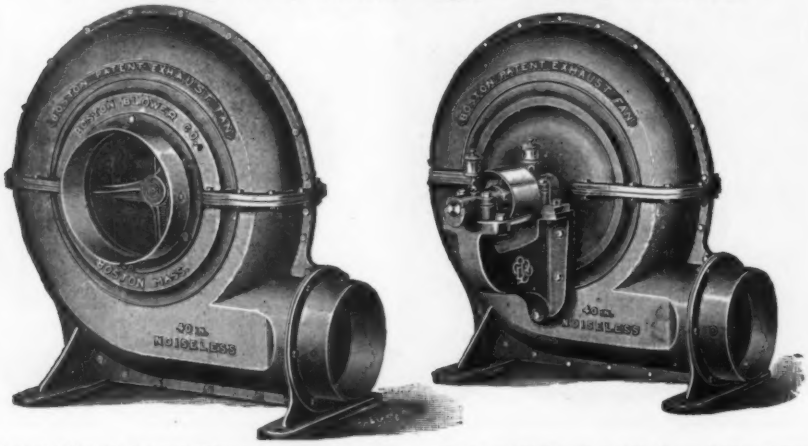
Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.



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This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

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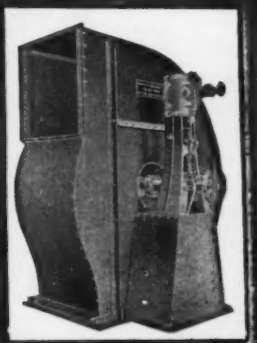

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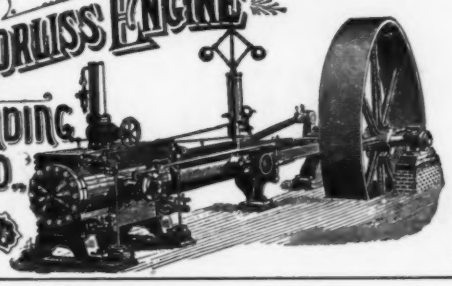

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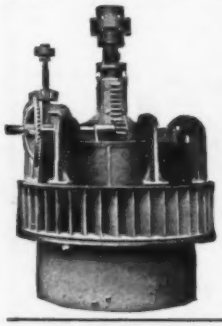

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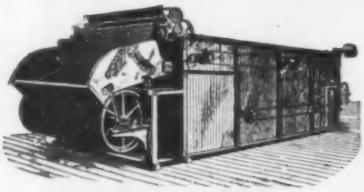

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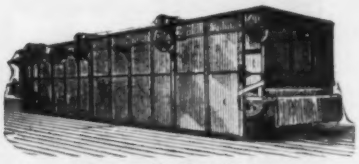

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For Cotton Stock, Wool Stock, Rags,
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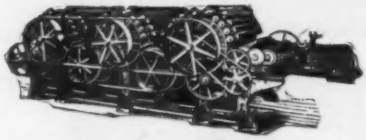

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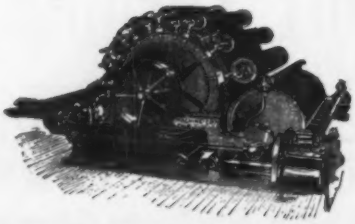

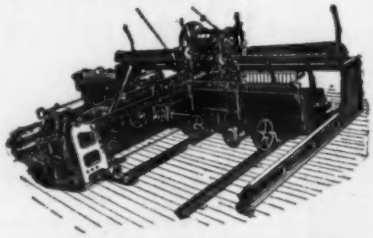

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To the Manufacturer of Woolens

There is an article printed in this number of the TEXTILE WORLD RECORD every word of which is of vital importance to you and to your business.

We hope you cannot read it without being awakened to a sense of the pressing need of sane and scientific advertising of the product of your mills.

The article referred to can, however, do no more than open up a question with you.

I would like to carry it along further—with you personally, if you will allow me.

I have facts and figures that, I promise, will interest you, and which I believe will convince you.

I am intensely interested in formulating and carrying to success advertising campaigns for textile manufacturers.

If you will give me an opportunity to explain to you how I think I can help your individual business, I will appreciate it highly and take the matter up with you promptly and thoroughly.

THOMAS BALMER, Advertising Manager

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No press-offs from knots, no flattening of yarn.
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for knitting purposes.

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FOSTER MACHINE COMPANY,
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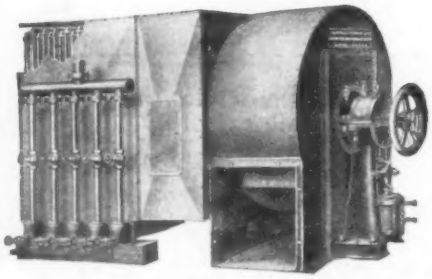

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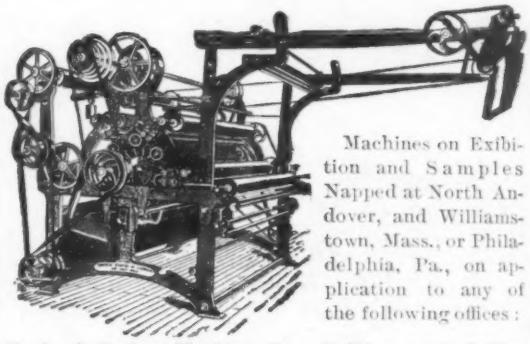

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